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ABSTRACT

The report presents the results of an Office of Demographic Studies study of the communication patterns of a national sample of 657 hearing impaired children. The extent to which various modes of communication (such as manual or oral) are used with hearing impaired children is examined, and the relationships between communication patterns and a variety of educationally significant personal and background characteristics of the children are investigated. The relationship between communication patterns and school achievement test scores in vocabulary, reading comprehension, mathematics concepts, and mathematics computation are also examined. Appendixes contain copies of the data collection instruments, a list of the schools and districts which participated in the project, and an examination of the characteristics of the Ss as compared to a larger national sample from which they were drawn. (Author/DIS)

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SERIES T
NUMBER 2

COMMUNICATION PATTERNS AND EDUCATIONAL ACHIEVEMENT OF HEARING IMPAIRED STUDENTS

Carl J. Jensema
Raymond J. Trybus

DATA FROM THE NATIONAL ACHIEVEMENT TEST STANDARDIZATION PROGRAM FOR HEARING IMPAIRED STUDENTS

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As is true of all products of the Office of Demographic Studies, this paper represents the efforts of all members of the ODS staff. The analysis of data and the subsequent writing of a report for publication are merely the last of many essential steps. We therefore acknowledge our debt, and extend our sincerest thanks, to all the members of the ODS staff.

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ABSTRACT

This report presents the results of a study of the reported communication patterns of a national sample of 657 hearing impaired children, selected at random from a larger national sample of 10,509 hearing impaired children involved in an achievement test standardization project. The first part of the report examines the extent to which various modes of communication are used with hearing impaired children across the country, while the second part investigates the relationships between communication patterns and a variety of educationally significant personal and background characteristics of the children. The final section examines the relationship between communication patterns and school achievement test scores in vocabulary, reading comprehension, mathematics concepts, and mathematics computation. A series of appendices contain copies of the data collection instruments, a list of the schools and school districts which participated in the project, and an examination of the characteristics of the children in the subsample as compared to those of the larger national sample from which the subsample was drawn.

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Communication Patterns and Educational Achievement of Hearing Impaired Students

Carl J. Jensema and Raymond J. Trybus

INTRODUCTION AND METHODOLOGY

One of the major issues in the education of hearing impaired children has long been that of the relative advantages of the various means employed to communicate with children who cannot hear. That this has been a major issue can be attested to—if that is necessary—by the size and tenor of the literature on the subject. A library search of published material related to this question of communication methods was conducted by Corbett and Jensema (Note 1) and is available in the form of an annotated bibliography with more than 400 entries.

Despite this volume of published materials, many of which are not research studies, comparatively little attention has been paid to description of the current state of affairs: just how do teachers and parents and their hearing impaired children actually communicate with each other on a day to day basis? The purpose of this monograph is to report the results of a national study of the communication patterns of hearing impaired children and of their parents and teachers and to relate these patterns and their variation to a variety of characteristics of the children and to their school achievement test scores.

Every year since its inception as a national statistical and research center in the education of hearing impaired children in 1968, Gallaudet College's Office of Demographic Studies, through its Annual Survey of Hearing Impaired Children and Youth, has studied the population of hearing impaired children enrolled in special educational programs for the hearing impaired throughout the United States. In addition to these regular population studies, the Office has, from time to time, conducted other studies in greater depth on selected samples of this population.

One such set of special studies, conducted in the spring of 1974, comprised "The National Achievement Test Standardization Program for Hearing Impaired Children." As the name indicates, the major purpose of this effort was to develop national norms for hearing impaired children on a Special Edition for Hearing Impaired Children of the 1973 Stanford Achievement Test. As part of this process, however, a variety of information, in addition to demographic data and achievement test scores, was collected from the parents and the classroom teachers of a subsample of the children involved in the standardization program. The data for this study of communication patterns were obtained from this subsample.

The sampling procedures. The process began with the identification of all programs (schools or school districts) known to be offering special education services to hearing impaired children during the 1972-73 school year (the year prior to the year in which the study was to be conducted). From this master list those programs were eliminated which served only children below the age of eight or which served only mentally retarded or other severely multiply-handicapped hearing impaired children. These exclusions were required because the test to be standardized was appropriate only for children eight years old and above who were in an academic program (i.e., the test was not intended to measure basic self-help or preacademic skills). A total of 766 programs remained as the eligible pool of school programs. These 766 programs were then clustered along two dimensions: type of program and size of enrollment. Three broad types of programs were identified: residential schools for the hearing impaired ($N = 86$), day schools for the hearing impaired ($N = 97$), and school district systems of classes and services ($N = 583$). Five categories of enrollment size were employed: 1-25 pupils, 26-75, 76-250, 251-400, and 401 or more. As classification of the 766 programs into this 15-cell table (three program types by five enrollment sizes) proceeded, it became apparent that some of the 15 cells of this matrix would be empty or nearly so. For example, there were few residential schools with enrollments of less than 76 children and few systems of classes and services with more than 250 children. Some adjacent cells in this matrix were therefore combined so that the final actual sampling matrix contained 11 cells rather than the planned 15. Since a 20% sample of the available children was the goal, one-fifth of the programs were chosen from each of the 11 cells by a random selection procedure. This resulted in a final sample of 151 programs with an estimated total enrollment of 10,400 hearing impaired children. These 151 programs were then contacted by mail, with

telephone follow-up where necessary, and asked to participate in the standardization project. The sampling frame involved all programs known to the ODS, regardless of whether or not they had previously participated in Annual Survey activities. A final total of 119 of the 151 programs actually participated in the project. A few programs in the original sample of 151 had closed or merged with other programs or had ceased to serve hearing impaired children. Some programs declined to participate in the project, but nearly all of these were programs with small enrollments, mostly in the category of systems of classes and services. Only two programs with enrollments of 76 children or more declined to participate. The final sample of 119 programs had a combined total enrollment of 10,509 hearing impaired children, which constituted 94.8% of the total enrollment of the original 151 programs (minus those no longer in operation), which actually turned out to be 11,085 children. These 119 programs were located in 38 states.

The achievement test standardization was then conducted on all children within the overall sample of 10,509 who were eight years old or above and who were in attendance on the test administration days. The total number actually tested was 6,873. The difference between this number and the total enrollment of 10,509 represents children under eight years old at the time of testing, a few small programs which dropped out of the study at this point after earlier submitting data, children who were absent on the testing days, children who were unable to be tested because of mental, emotional, or physical handicaps, and children who left the school in which they were originally enrolled between the time that demographic data were collected in fall and the time that the tests were administered in spring. (Large-scale national studies are rarely as neat and tidy as laboratory projects.) While many test standardization projects employ "alternate" or "replacement" schools or children in order to improve participation rates, this is not, strictly speaking, an acceptable practice from a sampling theory point of view, and therefore replacement was not employed in this study.

For purposes of further study, a random subsample (N = 1,362) was selected from the larger sample of 10,509 by choosing 13% of the children from each of the 119 participating schools. Separate questionnaires were sent to the parents and to the classroom teacher of each of the 1,362 children in this subsample. This was done by affixing a label containing the student's name and/or school identification code number to a copy of each questionnaire. The questionnaires were then sent to the administrative head of each school or program, with a request that they be forwarded to the parents and to the classroom teacher of the named student. The parents and teacher then completed the questionnaires and returned them directly to the Office of Demographic Studies by means of postage-paid envelopes which were provided. A telephone follow-up to the administrative heads of programs was conducted several weeks after the initial mailing to ask these administrators to encourage parents and teachers from whom replies had not yet been received to complete the forms. However, the proximity of the end of the school year precluded the possibility of extensive follow-up. A total of 997 usable questionnaires (73% response rate) was received from the teachers; and a total of 787 usable questionnaires (58% response rate) was received from the parents. Part of the nonresponse is accounted for by the programs which dropped out of the study during the year and by children who were no longer in the same school in which they were enrolled in fall, the basis on which the subsample was drawn.

For purposes of this study only those students (N = 657) were selected for whom we received *both* a teacher questionnaire and a parent questionnaire. While this reduces the sample size below the maximum attainable, it does make possible cross-analysis and data combinations which would not be possible if each set of data was treated separately. For the final part of this report, that dealing with the relationships between communication methods and school achievement test scores, the available pool of subjects was that portion of the 657 students who were administered achievement tests (i.e., were eight years old or older and were present on the testing days, etc.). This last section of the report, then, is based on 452 hearing impaired children for whom we have achievement test scores, teacher questionnaire data, parent questionnaire data, and basic demographic data.

The sampling procedures were straightforward in the selection of the large sample and the subsample; but since 100% returns were not received, a question remains as to the representativeness of the data available for analysis and presentation here. A reasonable approach to answering this question is to examine the distribution of some of the known characteristics of the available sample of 657 children employed in this study in comparison with the distribution of the same characteristics in the large national sample of 10,509. This larger sample, rather than the entire national data file (N = 43,794) of the 1973-74 Annual Survey, is the appropriate standard for comparison, since it is known that the larger file includes about 80% of the target population, an 80% which is known to be nonrandom in some respects (for example, participation is lowest among small programs of classes and services in school districts). Since the sample of 10,509 was drawn without respect to previous participation in the Annual Survey, and since about 95% complete returns on basic demographic data were received for that sample, it should constitute a more faithful representation of the national reality. Appendix 2 shows comparable distributions for the 657 children included in this study and for the 10,509 children in the larger sample. Chi-squared tests of goodness of fit were conducted, with the result that there were no significant differences between the two distributions in age, sex, degree of hearing loss, number of additional handicapping conditions beyond the hearing loss, and

ethnic background. The two distributions were not completely parallel with respect to the type of school program in which the student was enrolled—the sample of 657 had 37 children more than expected in the residential school category and correspondingly fewer children than anticipated in day schools for the deaf, part-time special education services, and in "other" program types; in the "age at onset of the hearing loss" category the sample of 657 had more children than expected who were reported to have been born deaf and fewer children than expected whose age at onset of the hearing loss was unknown. On balance, we consider the subsample a reasonably faithful representation of the national sample from which it was drawn.

The data collection instruments. Copies of the data forms used to obtain the basic demographic data from school officials and the "special studies" data from the parents and classroom teachers of children in the subsample are contained in Appendix 1. These forms are "self-report" instruments in the sense that no third-party verification of the information reported was done, due primarily to cost and time limitations (this study formed a small subpart of a much larger national test standardization project). Throughout this paper, then, the qualifier "as reported" must be understood as being attached to all data obtained in the study. We proceed on the assumption that parents and teachers answered as honestly and accurately as possible and that such distortions as there may be will be randomly distributed across respondents. In order to encourage accurate reporting, parents and teachers were provided with postage-paid return envelopes for returning survey forms directly to the survey office rather than to the school administrators. As in all studies conducted by the Office of Demographic Studies, respondents were promised confidentiality of the data, so that no response which could be identified with a specific child or specific school program would be made available for any purpose to persons other than survey staff.

The way in which the communication methods data were to be collected was, of course, an issue of major concern. The collective judgment of the advisors and consultants we engaged was that the descriptions of the methods should be as simple and behavioral as possible and should not include terms ordinarily associated with particular "philosophies" or points of view. Hence the terms "oralism," "total communication," and other related terms were nowhere employed. Instead, the ways in which people might communicate were listed as: cued speech, speech, signs with finger spelling, finger spelling alone, gestures and pantomime, writing, and "other." An individual respondent could indicate any one or any combination of methods as being used with a particular child. Parents were simply asked for a "yes/no" response to each of these communication behaviors, while classroom teachers were asked to respond to each on a four-point scale: "never," "sometimes," "usually," or "always," with definitions of these categories provided.

Another important limitation of the data presented here is that parents and teachers were asked to report only their current use of the various ways of communicating. No information was requested as to the length of time during which the methods had been used, the degree of skill with which they were used, or any significant changes which may have occurred in the child's life with respect to major means of communication. This decision was a purely practical one, and was not meant to downplay the potential importance of communication history. A review of the forms in Appendix 1 will make it clear that they are already lengthy, and that some very relevant questions had to be left unasked in order to have room to ask other questions.

The plan of this report. The remainder of this paper is divided into three parts. The first of these examines the extent to which each of the methods of communication is used and describes some relationships among these means. The second part examines the relationships between speech and sign use and a series of demographic characteristics of the children. The third part focuses on the relationships among speech use, sign use, and the child's academic achievement test scores. The purpose of this study is to describe as accurately as possible who is using how much of what means of communication with what kinds of children, and how this relates to school achievement scores. The key word is *describe*. This is not an experimental study, but a descriptive one. An experimental study would be designed to minimize extraneous sources of variation and to test most clearly the differential effects of different methods, each of which is used in its pure form. Our purpose here is exactly the opposite. We set out, not to eliminate or control related variables, but to examine them and their interrelationships. We set out, not to find examples of "best practice" of various methods and pit them against each other, but to describe, within the limits of our methodology, what is happening nationally in the area of communication with hearing impaired children, and how the actual practice of various methods relates to the characteristics of the children and to their school achievement scores. Therefore, this study does not outline what children's communication patterns should be. It is simply an examination of the present situation in all its complexity, to the extent to which our methods have allowed us to reflect that complexity.

DATA ANALYSIS

PART 1: A Description of Reported Communication Use

This first section concentrates on overall description of the extent to which various means of communication are used between child and parents and between child and classroom teacher.

Table 1 gives the number and percent of children whose parents report the use of each of six communication modes. It is clear that speech, either by itself or in combination with other modes, is by far the most frequent mode used by both parents and their hearing impaired children. The children use signs somewhat more (41%) than do their parents (32%), and they use speech a bit less (70% versus 80%). Otherwise, the two groups are reported to have quite similar communication patterns.

TABLE 1: FREQUENCY DISTRIBUTION OF REPORTED PARENT-STUDENT COMMUNICATION USE

	Reported Used in Parent To Student Communication		Reported Used in Student To Parent Communication	
	N	%	*N*	%
Speech	524	79.8	461	70.2
Signs	209	31.8	272	41.4
Finger Spelling	153	23.3	173	26.3
Writing	118	18.0	129	19.6
Gestures	194	29.5	192	29.2
Other	14	2.1	20	3.0

TABLE 2. COMBINATIONS OF PARENT-CHILD COMMUNICATION MODES

	Speech	Signs	Finger Spelling	Writing	Gestures	Parent to Child *N*	Parent to Child %	Child to Parent *N*	Child to Parent %
1.	Speech	—	—	—	—	260	39.6	204	31.1
2.	Speech	—	—	—	Gestures	72	11.0	64	9.7
3.	Speech	Signs	—	—	—	36	5.5	41	6.2
4.	—	Signs	—	—	—	36	5.5	60	9.1
5.	Speech	Signs	Finger Sp	—	—	30	4.6	32	4.9
6.	Speech	Signs	Finger Sp	Writing	Gestures	24	3.7	22	3.3
7.	—	—	—	—	Gestures	24	3.7	22	3.3
8.	Speech	Signs	—	—	Gestures	19	2.9	16	2.4
9.	Speech	—	—	Writing	—	15	2.3	17	2.6
10.	Speech	—	—	Writing	Gestures	13	2.0	8	1.2
11.	—	Signs	Finger Sp	—	—	13	2.0	21	3.2
12.	Speech	—	Finger Sp	—	—	12	1.8	14	2.1
13.	Speech	Signs	Finger Sp	Writing	—	11	1.7	11	1.7
14.	—	—	Finger Sp	—	—	11	1.7	13	2.0
15.	—	—	Finger Sp	Writing	—	10	1.5	9	1.4
16.	Speech	Signs	Finger Sp	—	Gestures	8	1.2	8	1.2
17.	—	Signs	Finger Sp	Writing	—	8	1.2	13	2.0
18.	Speech	Signs	—	Writing	—	7	1.1	8	1.2
19.	Speech	—	Finger Sp	Writing	—	7	1.1	7	1.1
20.	—	—	—	Writing	Gestures	6	0.9	4	0.6
21.	—	Signs	—	—	Gestures	5	0.8	17	2.6
22.	Speech	—	Finger Sp	Writing	Gestures	4	0.6	5	0.8
23.	—	Signs	Finger Sp	—	Gestures	4	0.6	5	0.8
24.	Speech	—	Finger Sp	—	Gestures	4	0.6	—	—
25.	—	Signs	Finger Sp	Writing	Gestures	3	0.5	6	0.9
26.	—	—	—	Writing	—	3	0.5	4	0.6
27.	—	—	—	—	—	3	0.5	7	1.1
28.	Speech	Signs	—	Writing	Gestures	2	0.3	4	0.6
29.	—	Signs	—	Writing	Gestures	2	0.3	4	0.6
30.	—	—	Finger Sp	Writing	Gestures	2	0.3	3	0.5
31.	—	—	Finger Sp	—	Gestures	2	0.3	4	0.6
32.	—	Signs	—	Writing	—	1	0.2	4	0.6
					TOTAL	657	100.0	657	100.0

Since Table 1 indicates that a few parents ($N = 14$) and children ($N = 20$) use "other" ways of communicating, an examination was made of the written descriptions of these "other" modes. The most frequently reported "other" mode was "total communication," followed by "lipreading." Both of these responses should have been reported in the various specific categories or combinations, suggesting that these few parents did not follow the questionnaire instructions. Since the number of such responses was so small, however, these "other" responses were simply excluded from further analysis.

Examination of the combinations of modes used, as presented in Table 2, amplifies the overall findings of Table 1. With the "other" category excluded, there remained 32 possible combinations of methods. All 32 combinations actually occurred in the parent-to-child situation, and all but one combination occurred in the child-to-parent data. Speech alone is the most frequently reported mode, accounting for nearly 40% of the total parent-to-child communication; another 11% supplement speech with gestures. From another perspective these figures indicate that 60% of parents and 69% of children either supplement speech with other modes such as gestures or signs or use such other modes without using speech.

The communication data obtained from teachers are more complex than those from parents, both because of the addition of cued speech as a possible method and because teachers were asked to provide frequency of usage ratings instead of simple "yes/no" responses, using four categories: "never," "sometimes," "usually," "always." The reported ratings for teacher-to-student communication are presented in Table 3, and those for student-to-teacher communication appear in Table 4. In both cases, speech is the method most often reported as being "always" used, although the speech emphasis is much stronger among teachers (51% always use speech) than among their students (34% always use speech). Signs were the method next most frequently reported as "always" used, although it is somewhat surprising to see that teachers emphasize use of signs (38% always use signs) more than their students do (27% always use signs).

With respect to cued speech, asked only of the teachers, 10% of the teachers responding to the item indicated that they use cued speech at least sometimes. Students use cued speech somewhat less than their teachers, with a bit under 6% reported to use it at least sometimes.

The write-in responses to the "other" category were examined here, as they were in the parent responses. In this case "total communication" was again the most frequently reported "other" method, although in the case of the teachers this was generally a redundant response (given in addition to, rather than instead of, a series of responses to the specified methods). A few of the "other" responses did indicate modes of communication other than those listed on the questionnaire, such as the use of drawings or illustrations and the assistance of mechanical aids such as overhead projectors. Because of the very small number of "other" responses, they were excluded from further analysis. For the sake of simplicity and comparability with the data derived from parents, the cued speech responses also were excluded from the remainder of the analyses.

TABLE 3: REPORTED FREQUENCY OF COMMUNICATION MODE USAGE IN TEACHER TO STUDENT INTERACTION

Frequency of Use	Speech		Signs		Finger Spelling		Gestures		Writing		Cued Speech		Other	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
Always (more than 90% of time)	317	51.4	219	37.5	47	8.7	27	4.7	23	4.1	10	1.8	78	52.0
Usually (51-90% of time)	74	12.0	83	14.2	37	6.8	73	12.6	59	10.6	10	1.8	31	20.7
Sometimes (10-50% of time)	137	22.2	102	17.5	198	36.5	387	67.0	289	51.7	35	6.4	22	14.7
Never (less than 10% of time)	89	14.4	180	30.8	261	48.1	91	15.7	188	33.6	488	89.9	19	12.7
Not Reported	40		73		114		79		98		114		507	
TOTAL	657	100.0	657	100.0	657	100.0	657	100.0	657	100.0	657	100.0	657	100.0

TABLE 4: REPORTED FREQUENCY OF COMMUNICATION MODE USAGE IN STUDENT TO TEACHER INTERACTION

Frequency of Use	Speech		Signs		Finger Spelling		Gestures		Writing		Cued Speech		Other	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
Always (more than 90% of time)	211	34.4	163	27.2	14	2.6	33	5.5	8	1.4	4	.8	32	29.6
Usually (51-90% of time)	128	20.9	129	21.5	53	9.7	108	18.1	19	3.3	6	1.1	27	25.0
Sometimes (10-50% of time)	150	24.5	134	22.4	217	39.5	358	60.0	241	43.6	21	3.9	23	21.3
Never (less than 10% of time)	124	20.2	173	28.9	265	48.3	98	16.4	286	51.7	502	94.2	26	24.1
Not Reported	44		58		108		60		104		124		549	
TOTAL	657	100.0	657	100.0	657	100.0	657	100.0	657	100.0	657	100.0	657	100.0

While Tables 3 and 4 indicate the overall ratings of communication usage in the classroom, they do not show the combinations of methods which were reported. Presentation of combinations based on the teacher-supplied data is more involved than in the case of the parent data, since it is not limited to "yes/no" responses. To simplify the presentation, therefore, the data were recoded to the equivalent of "yes" if the response of the teacher was "always," "usually," or "sometimes." All other records were recoded to the equivalent of "no." Table 5 presents the results of this procedure, and the entries, as in Table 2, are arranged in descending order of frequency.

There is substantially more diversity of communication patterns among the teacher ratings than among the parent ratings. Whereas one pattern, the use of speech alone, accounted for 40% of the parent-to-child responses, that same pattern accounts for only 11% of the teacher-to-student responses. The most common teacher-to-student pattern was the use of all methods—speech, signs, finger spelling, writing, and gestures—but this pattern accounted for only 22% of the responses, as compared with the 40% figure for the most common parent-to-child pattern, speech alone. There is also relatively little agreement between teacher and parent rankings of the frequency of use of the various patterns of communication modes. When the rankings of parents' patterns of use are correlated with rankings of the same 32 combinations by teachers, the resulting Spearman rank correlation coefficient (corrected for ties) is only .24, which is not statistically significant at the .05 level. These findings again reflect the apparently general lack of consistency between home and school use of the various communication modes.

The use of signs as part of the communication pattern was much more frequent among teachers (61.7% reported using signs) than among parents (32.1% reported using signs). The classroom figures correspond closely to these reported by Jordan, Gustason, and Rosen (1976), which indicate that 64% of classes for hearing impaired children nationally report using "total communication," defined as "the use of manual signs, finger spelling, speechreading, and amplification." Perhaps the most important overall finding from Table 5 is that the use of multiple modes, rather than any single mode, is the rule in classrooms. While on the one hand this may not be at all a surprising finding, on the other hand it underscores the importance of avoiding the use of simple "either/or" labels to represent the communication patterns which actually occur in day-to-day practice in the schools. Table 5 suggests that the general situation is a rich diversity and complexity which simply cannot be faithfully reflected by the use of single labels.

The next area of interest in the overall description of the use of communication modes is the interrelationships among the various modes in the home and school settings for which reports were received. Table 6 presents this information in the form of a correlation matrix. In order to obtain these correlation coefficients,

parent questionnaire responses were coded 1 for "yes" and 0 for "no"; teacher questionnaire responses were coded 0 for "never," 1 for "sometimes," 2 for "usually," and 3 for "always."

A variety of interesting results emerges from Table 6. First, note that speech use is always negatively correlated with the use of signs and the use of finger spelling, and has either small negative correlations or nonsignificant (zero order) correlations with the use of writing and the use of gestures. This means that the general tendency is for the amount of speech, on the one hand, and the amount of signs or finger spelling, on the other, to be employed reciprocally: when the use of speech is high, use of signs or finger spelling is low, and vice versa. This pattern holds in all four of the communication situations studied here: parent-to-child, child-to-parent, teacher-to-student, and student-to-teacher.

Not surprisingly, the correlations between child-to-parent and parent-to-child ratings for each method are quite high, as are the correlations between teacher-to-student and student-to-teacher ratings for each method. This may well be due in part to the fact that the same rater (namely, the parent or the teacher) provided each pair of ratings, as well as to any actual commonality of method.

Of greater importance are the correlations which reflect the extent to which parents and teachers report use of the same methods, and those which reflect the extent to which students use the same methods when communicating with parents or teachers. All of these correlations are relatively low. For example, the correlation between parental use of speech and teacher's use of speech with the same child is only .22; the correlation between parental and teacher use of signs is .39. These figures indicate that there is, in general,

TABLE 5. COMBINATIONS OF TEACHER-STUDENT COMMUNICATION MODES

	Speech	Signs	Finger Spelling	Writing	Gestures	Teacher to Student N	Teacher to Student %	Student to Teacher N	Student to Teacher %
1.	Speech	Signs	Finger Sp	Writing	Gestures	143	21.7	116	17.6
2.	Speech	—	—	—	—	74	11.2	80	12.2
3.	Speech	Signs	—	Writing	Gestures	63	9.6	34	5.2
4.	Speech	—	—	Writing	Gestures	61	9.3	35	5.3
5.	Speech	—	—	—	Gestures	51	7.8	71	10.8
6.	—	Signs	Finger Sp	Writing	Gestures	42	6.4	48	7.3
7.	Speech	Signs	Finger Sp	—	Gestures	40	6.1	51	7.8
8.	Speech	Signs	—	—	Gestures	25	3.8	51	7.8
9.	Speech	—	—	Writing	—	19	2.9	10	1.5
10.	—	—	—	—	—	18	2.8	14	2.3
11.	Speech	Signs	—	—	—	18	2.8	16	2.4
12.	—	Signs	Finger Sp	—	Gestures	15	2.3	39	5.9
13.	—	Signs	—	—	Gestures	13	2.0	27	4.1
14.	Speech	—	Finger Sp	Writing	Gestures	12	1.8	5	0.8
15.	Speech	Signs	Finger Sp	—	—	11	1.7	11	1.7
16.	—	Signs	—	Writing	Gestures	9	1.4	10	1.5
17.	—	Signs	—	—	—	9	1.4	13	2.0
18.	—	Signs	—	Writing	—	5	0.8	—	—
19.	Speech	Signs	Finger Sp	Writing	—	4	0.6	3	0.5
20.	Speech	Signs	—	Writing	—	4	0.6	2	0.3
21.	—	—	—	Writing	Gestures	4	0.6	—	—
22.	Speech	—	Finger Sp	—	Gestures	3	0.5	3	0.5
23.	—	—	Finger Sp	Writing	Gestures	3	0.5	—	—
24.	—	Signs	Finger Sp	—	—	2	0.3	4	0.6
25.	—	—	Finger Sp	—	Gestures	2	0.3	1	0.2
26.	—	—	Finger Sp	—	—	2	0.3	—	—
27.	—	—	—	—	Gestures	2	0.3	9	1.4
28.	Speech	—	Finger Sp	—	—	1	0.2	—	—
29.	—	Signs	Finger Sp	Writing	—	1	0.2	1	0.2
30.	—	—	Finger Sp	Writing	—	1	0.2	—	—
31.	Speech	—	Finger Sp	Writing	—	—	—	2	0.3
32.	—	—	—	Writing	—	—	—	1	0.2
					TOTAL	657	100.0	657	100.0

relatively little consistency between home and school in the use of speech, signs, and the other means of communication. Most proponents of a specific means of communicating emphasize the importance of home/school consistency in the use of the method which has been selected, but these results suggest that this consistency is lacking in practice. As to the hearing impaired children themselves, they appear to show somewhat greater consistency in their communication patterns in the two situations (home and school), but here also there is far from complete consistency. The correlation between children's use of speech at home and at school is .46, between home and school use of signs .48. If consistency is in fact important, these results suggest an area in great need of improvement by educators and parents alike in the future.

In summary, then, the overall data on usage of the various communication modes suggest (1) that there is much variability in the communication patterns employed with hearing impaired children; (2) combinations of methods, rather than single methods, are the rule in the classroom but far less so at home; (3) the use of speech alone is the single most common pattern at home, while a combination of speech, signs, finger spelling, writing, and gestures is the single most common pattern at school; and (4) there is relatively little consistency between patterns of communication used at home and in school.

TABLE 6: CORRELATIONS AMONG COMMUNICATION MODES

		PARENT TO STUDENT					STUDENT TO PARENT					TEACHER TO STUDENT					STUDENT TO TEACHER				
		Speech	Signs	Finger spelling	Writing	Gestures	Speech	Signs	Finger spelling	Writing	Gestures	Speech	Signs-With-Finger spelling	Finger spelling	Gestures	Writing	Speech	Signs-With-Finger spelling	Finger spelling	Gestures	Writing
PARENT TO STUDENT	Speech	1.00	−.24	−.20	−.1!	−.07	.69	−.26	−.15	−.08	.01	.22	−.22	−.22	−.14	−.10	.39	−.28	−.18	−.12	−.03
	Signs		1.00	.40	.17	.04	−.26	.73	.38	.16	.00	−.27	.39	.24	.13	.08	−.35	.41	.22	.16	.02
	Finger spelling			1.00	.40	.04	−.19	.33	.82	.34	.02	−.28	.29	.28	.12	.10	−.37	.32	.24	.15	.10
	Writing				1.00	.18	−.08	.14	.36	.80	.12	−.18	.20	.16	.11	.07	−.23	.27	.19	.13	.13
	Gestures					1.00	−.12	.12	.06	.23	.68	−.12	.10	.04	.16	.04	−.24	.08	.11	.24	.05
STUDENT TO PARENT	Speech						1.00	−.33	−.17	−.07	−.06	.23	−.26	−.30	−.16	−.11	.46	−.33	−.26	−.19	−.03
	Signs							1.00	.32	.14	.02	−.31	.46	.27	.20	.13	−.41	.48	.26	.21	.10
	Finger spelling								1.00	.36	.02	−.24	.30	.33	.14	.15	−.33	.36	.28	.17	.15
	Writing									1.00	.15	−.16	.21	.20	.07	.04	−.21	.28	.24	.12	.11
	Gestures										1.00	−.03	−.01	−.02	.10	.00	−.16	−.03	.01	.24	.02
TEACHER TO STUDENT	Speech											1.00	−.28	−.27	−.13	.00	.67	−.31	−.24	−.14	−.01
	Signs-With-Finger spelling												1.00	.26	.24	.18	−.41	.82	.35	.23	.15
	Finger spelling													1.00	.34	.29	−.30	.40	.77	.27	.25
	Gestures														1.00	.38	−.25	.29	.38	.64	.31
	Writing															1.00	−.08	.22	.33	.31	.58
STUDENT TO TEACHER	Speech																1.00	−.48	−.29	−.33	−.03
	Signs-With-Finger spelling																	1.00	.45	.31	.23
	Finger spelling																		1.00	.27	.35
	Gestures																			1.00	.33
	Writing																				1.00

DATA ANALYSIS

PART 2: The Relationships Between Communication Patterns and Characteristics of the Child

The first part of this report presented descriptive information on the communication patterns reported to be in use with hearing impaired children at home and at school. In this part of the report, the overall results are examined with an eye to the differences in communication patterns which are related to various educationally relevant characteristics of the hearing impaired children involved. Because of the complexity involved in attempting to do such an analysis with 32 communication patterns, Part 2 concentrates on variations in the use of speech and in the use of signs, the two most frequently reported modes of communication. Further, since even a concentration on only these two modes in each of the four communication situations (parent-to-child, child-to-parent, teacher-to-student, and student-to-teacher) produces an unwieldy list of eight variables, two overall indices, called the "speech environment score" and the "sign environment score," were developed.

These "environment" scores were produced as follows. The individual scores in each of the eight communication situations/method combinations were rescaled to standard scores based on a scale with a mean of zero and a standard deviation of one. The four scores for each method were then added, and the resulting scores were again standardized on a scale with a mean of zero and a standard deviation of one. Each subject for the study thus received two overall scores, a sign environment score and a speech environment score. These scores essentially describe the difference in the amount of speech or amount of signs used by the individual child from the overall average amount of speech or signs used by the entire sample, summing across the four communication situations for each method. A positive speech environment score, for example, means that the individual in question uses (and/or receives) more speech communication than the average for this sample. A negative score means less than average speech use.

The relationships between these environment scores and a variety of educationally significant characteristics of the children were then investigated. While this portion of the report examines relationships by one characteristic at a time, it is absolutely essential to bear in mind the results of many previous studies by ODS and others which indicate that these variables are highly intercorrelated. These single-variable analyses are of value, however, in examining the detailed trends which exist in the data.

Age. The relationship between age and the communication variables is examined in Table 7. The general trend is for speech to be used less, and signs to be used more, with the older groups of children. This trend is most pronounced in teacher-to-student and student-to-teacher use of signs. For each column of Table 7, and similarly for the other tables in this section of the report, a one-way analysis of variance was performed across the categories of the variable under consideration, in this case the age of the child. In regard to age, the reported F-ratios for these analyses of variance are significant beyond the .01 level for four out of the ten columns of data. The final row of the table reports the correlation between the communication scores and the variable (such as age here) under consideration. For all of these correlations, a value of ± .09 is significant at the .05 level, and a value of ± .11 is significant at the .01 level. The analysis of variance results and the correlations overall indicate that age is significantly related to speech and sign use at school and to the speech and sign environment scores. On the other hand, at-home use of speech and signs does not vary as systematically with age as does the school use of these modes.

TABLE 7: MEAN SPEECH AND SIGN USE BY STUDENT AGE

		Speech					Signs				
Age	*N*	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Speech Environment	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Sign Environment
≤6	98	.10	.03	.22	.05	.10	−.02	.01	−.53	−.54	−.21
7 - 9	221	.01	.01	.05	.05	.05	−.04	.02	−.11	−.18	−.10
10 - 12	103	.14	.04	.11	.16	.11	−.02	−.05	−.01	.03	−.02
13 - 15	126	−.07	.03	−.07	−.04	−.05	.03	.03	.17	.30	.14
16 - 18	92	−.23	−.11	−.34	−.28	−.28	.09	−.05	.40	.43	.23
≥19	17	.21	−.12	−.16	.01	−.01	.08	.00	.65	.40	.36
ALL AGES	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova		1.82	.23	3.52*	2.03	2.05	.28	.14	10.43*	13.09*	3.34*
Correlations		−.07	−.03	−.15	−.09	−.10	.04	−.01	.28	.31	.16

*Significant At The .01 Level

TABLE 8: MEAN SPEECH AND SIGN USE BY BETTER-EAR-AVERAGE HEARING LEVEL CATEGORIES

Better-Ear-Average Hearing Level	N	Speech: Parent To Student	Speech: Student To Parent	Speech: Teacher To Student	Speech: Student To Teacher	Speech Environment	Signs: Parent To Student	Signs: Student To Parent	Signs: Teacher To Student	Signs: Student To Teacher	Sign Environment
Normal (< 27 dB)	8	.50	.65	.87	.89	.92	−.68	−.84	−.93	−1.08	−1.01
Mild (27-40 dB)	11	.50	.45	.31	.66	.63	−.49	−.66	−.85	−.97	−.88
Moderate (41-55 dB)	46	.50	.65	.44	.84	.80	−.59	−.71	−.96	−1.03	−.93
Mod. Severe (56-70 dB)	73	.37	.44	.48	.65	.63	−.36	−.45	−.29	−.58	−.50
Severe (71-90 dB)	173	.11	.13	−.01	.03	.09	−.08	−.04	.03	.00	−.03
Profound (≥ 91 dB)	319	−.21	−.27	−.20	−.36	−.32	.24	.26	.23	.32	.32
Hearing Level not Reported	27										
ALL HEARING LEVELS	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova*		8.78	12.82	7.68	22.08	21.18	9.12	13.08	12.58	22.45	21.6
Correlations		.25	.31	.25	.41	.39	−.28	−.33	−.33	−.43	−.41

*All F Values Are Significant Beyond The .01 Level

Sex. The male/female differences in all the communication variables are extremely small and did not approach statistical significance. Hence, no tabular presentation of these data is provided.

Age at Onset of the Hearing Loss. Although this variable is of great importance both theoretically and practically in education, for this sample (as for the national population) only 4% of the children for whom the age at onset is known had an onset at age three or later. Since there are so few ($N = 25$) post-lingually deafened children in this sample, it was not feasible to conduct detailed analysis of this variable or to include it in other later analyses.

Hearing Level. One of the major variables related to speech and sign use is the child's hearing level. Table 8 shows clearly that, in all the communication situations studied, the clear trend is for less speech use and more sign use as the child's hearing level moves away from normal in the direction of less and less usable hearing. There appears to be a particularly pronounced shift in communication patterns at a hearing level of 70 dB. When the hearing level is at 70 dB or less, the emphasis is on speech with relatively little use of signs. When hearing levels decline beyond 70 dB, there is a clear shift in emphasis away from speech and towards a greater reliance on signs. In other words, these data suggest the simple conclusion that the severity of the handicap is one of the major influences on the selection of the communication pattern used with a child.

Additional Handicapping Conditions. Tables 9 and 10 present information on variations in speech use and sign use as a function of the number and kinds of additional handicapping conditions the hearing impaired child is reported to have. From Table 9 there appear to be no great or consistent differences in the amount of sign use as the number of additional handicapping conditions increases. Speech use, however, clearly declines as the child is reported to have more such conditions. Table 10 suggests that there are clear differences from the average in communication patterns for children with two specific additional handi-

TABLE 9: MEAN SPEECH AND SIGN USE BY NUMBER OF REPORTED ADDITIONAL HANDICAPS

Number of Additional Handicaps	N	Speech: Parent To Student	Speech: Student To Parent	Speech: Teacher To Student	Speech: Student To Teacher	Speech Environment	Signs: Parent To Student	Signs: Student To Parent	Signs: Teacher To Student	Signs: Student To Teacher	Sign Environment
None Reported	471	.02	.02	.03	.02	.02	.00	−.03	−.01	.02	.00
One	121	.05	.02	−.06	.10	.05	−.02	.02	−.07	−.08	−.07
Two	45	−.22	−.03	−.19	−.24	−.24	.08	.20	.17	.10	.14
Three	12	.30	.10	.24	−.13	.20	−.32	−.33	−.37	−.66	−.40
Four	8	−1.36	−1.26	.12	−1.11	−1.06	.66	.68	.92	.45	.84
ALL STUDENTS	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova		4.74*	3.30**	.76	3.16**	3.19**	1.28	1.79	2.46	1.80	2.22
Correlations		−.09	−.07	−.02	−.09	−.08	.02	.06	.05	.01	.03

*Significant At The .01 Level
**Significant At The .05 Level

TABLE 10: MEAN SPEECH AND SIGN USE BY TYPES OF ADDITIONAL HANDICAPS REPORTED

Additional Handicaps	N	Speech: Parent To Student	Speech: Student To Parent	Speech: Teacher To Student	Speech: Student To Teacher	Speech Environment	Signs: Parent To Student	Signs: Student To Parent	Signs: Teacher To Student	Signs: Student To Teacher	Sign Environment
Brain Damage	17	−.52**	−.50**	−.28	−.72*	−.68*	.58**	.47**	.72*	.45	.59**
Cerebral Palsy	18	−.46**	−.56**	.00	−.61**	−.49**	.27	.40	.42	.31	.43
Epilepsy	5	.00	.21	.52	.44	.39	.60	.78	1.12**	.42	.72
Heart Disorder	21	−.21	.03	−.23	−.33	−.25	.03	.13	.29	.15	.16
Mental Retardation	32	−.28	−.30	.00	−.25	−.23	−.01	−.02	.12	−.06	.02
Orthopedic	9	−.33	−.08	−.25	−.11	−.29	−.21	−.16	.44	−.19	−.12
Perceptual-Motor	47	−.24	−.19	−.12	−.22	−.21	.23	.20	.06	.10	.18
Emotional/Behavioral	55	−.08	.02	−.07	−.07	−.04	−.06	.16	.00	−.18	−.02
Visual Problems	39	−.07	−.08	.14	.05	.03	−.08	−.06	−.24	−.32	−.20
Other	35	.14	.14	−.06	.06	.07	−.18	−.24	−.13	−.21	−.23

*Communication Of Students With This Handicap Differs From Other Students At The .01 Level of Confidence
**Communication Of Students With This Handicap Differs From Other Students At The .05 Level of Confidence

capping conditions: brain damage and cerebral palsy. For these two groups, there is clearly a below average amount of speech use, coupled with an above average amount of use of signs. This picture is probably influenced somewhat by the educational placements of some of the children who have additional handicaps in schools or classes for multiply handicapped children rather than in programs designed for children with hearing impairments.

Ethnic Background. Differences in speech use and sign use by ethnic background are presented in Table 11. The data on sign use show a slight trend for sign use to be greater with nonwhite children than with whites, but the differences are generally small enough that they do not reach statistical significance in the one-way analysis of variance. In the case of speech use, however, there are quite large and consistent differences in that both parents *and teachers* use substantially more speech with white children than with children from black, Hispanic, and other ethnic minority backgrounds. Why this should be so is not immediately apparent, but the issue is of sufficient potential importance that it deserves further examination. One closely related consideration is family income level, since racial/ethnic background and income are still closely related in the United States. The following section presents this information.

Family Income Level. Family socioeconomic status or its components—education, occupation, and income—have been largely overlooked in educational research with hearing impaired children. Questions on all three components were included in the parent questionnaire in this study, but since the family income level was simplest to handle and at the same time showed the same relationships as the data for education and occupation, we have elected to use income level alone as a surrogate for the broader variable of socioeconomic status. Table 12 shows the variations in the amount of speech use and amount of sign use as a function of the family's reported income level as of spring, 1974. There is a clear trend for more use of speech in the communication environment for children from higher income families; this trend holds both for communication used at home and at school. In other words, this means that teachers, as well as parents, vary the use of speech systematically according to the economic level of the

TABLE 11: MEAN SPEECH AND SIGN USE BY ETHNIC BACKGROUND

Ethnic Background	N	Speech: Parent To Student	Speech: Student To Parent	Speech: Teacher To Student	Speech: Student To Teacher	Speech Environment	Signs: Parent To Student	Signs: Student To Parent	Signs: Teacher To Student	Signs: Student To Teacher	Sign Environment
White	455	.11	.14	.11	.12	.16	−.04	−.08	−.01	−.04	−.05
Black	97	−.47	−.50	−.42	−.54	−.61	.16	.21	−.03	.21	.16
Spanish-American	74	−.20	−.38	−.14	−.22	−.32	−.04	.12	.04	.00	.04
Other	4	−.74	−.44	−.66	−.61	−.77	.39	−.33	.85	1.02	.34
Not Reported	27										
ALL ETHNIC BACKGROUNDS	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova		9.84*	14.31*	6.38*	11.51*	17.85*	1.24	2.67**	.72	2.22	1.18

*Significant Beyond The .01 Level
**Significant Beyond The .05 Level

TABLE 12: MEAN SPEECH AND SIGN USE BY ANNUAL PARENTAL INCOME

		Speech					Signs				
Parental Income	N	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Speech Environment	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Sign Environment
< $ 5,000	122	−.31	−.39	−.25	−.38	−.43	.16	.11	.03	.11	.11
$ 5,000 - $ 9,999	165	−.12	−.09	.01	−.12	−.10	.03	.06	.15	.15	.13
$10,000 - $14,999	190	.16	.10	.01	.11	.13	−.04	−.01	−.11	−.11	−.08
$15,000 - $19,999	78	.18	.34	.22	.36	.36	−.27	−.19	[illegible]	−.13	−.19
≥ $20,000	68	.32	.30	.24	.30	.37	.08	−.12	−.07	−.10	−.06
Not Reported	34										
ALL STUDENTS	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova		6.64*	7.83*	3.16*	7.49*	10.50*	1.97	1.19	1.26	1.77	1.68
Correlations		.21	.23	.15	.24	.27	−.07	−.09	[illegible]	−.10	−.09

*Significant Beyond The .01 Level

child's family. A less pronounced and less consistent trend is seen in the data on sign use. In this case the trend, although slight, is for both parents and teachers to use signs more with children from lower income families and less with children from higher income families. That families differ in communication patterns across ethnic and income lines is somehow less surprising than that the same variations are reported quite independently by the teachers. Perhaps this lends support to the hypothesis that the teachers are trying to adapt their communication patterns to styles which they perceive to be appropriate to the ethnic and socioeconomic backgrounds of their students. It is also possible, however, to hypothesize from these data that teachers are responding less to the perceived needs of their students and more to their own biases and stereotypes of racial/cultural/economic groups. Whatever the reason, these data indicate that teachers do report communicating differently with students from these various backgrounds. This is an area deserving of further study. The fact that differences in communication patterns are related to racial/ethnic and socioeconomic differences is also a critically important consideration for any investigation which attempts to relate communication style to other variables, such as reading ability or other educational outcomes. Based on these data, one would find that groups of hearing impaired children who differ in communication style differ also in racial/ethnic composition and in socioeconomic backgrounds.

Preschool Attendance. Table 13 indicates that later use of speech and signs bears some relationship to whether or not the hearing impaired child attended a preschool program. The data indicate that there is a greater speech emphasis by and with children who attended preschool, strikingly so in the case of parent-to-child communication. There is a slight opposite trend in sign use, with slightly less use of signs reported for children who attended preschool than for those who did not. The sign use differences, however, did not reach statistical significance. This relationship cannot be taken as a simple causal one, however—i.e., that more speech use results from preschool attendance—since, as Jensema reports (in Rawlings & Jensema, 1977), children from higher income families are far more likely to have attended a preschool program. These differences, in other words, are due, at least in part, to socioeconomic differences between families

TABLE 13: MEAN SPEECH AND SIGN USE ACCORDING TO ATTENDANCE IN PRESCHOOL

		Speech					Signs				
Preschool	N	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Speech Environment	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Sign Environment
No	184	−.36	−.31	−.23	−.21	−.37	.11	.09	.06	.11	.10
Yes	467	1.40	.12	.09	.08	.14	−.04	−.03	−.02	−.04	−.04
Not Reported	6										
ALL STUDENTS	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova		17.56*	12.84*	6.52*	5.43*	18.16*	1.80	1.62	.48	1.44	1.65
Correlations		.23	.20	.14	.13	.23	−.07	−.05	−.04	−.07	−.06

*Significant Beyond The .01 Level

TABLE 14: MEAN SPEECH AND SIGN USE BY PROGRAM TYPE

Program Type	N	Speech: Parent To Student	Speech: Student To Parent	Speech: Teacher To Student	Speech: Student To Teacher	Speech Environment	Signs: Parent To Student	Signs: Student To Parent	Signs: Teacher To Student	Signs: Student To Teacher	Sign Environment
Residential School	293	−.24	−.30	−.30	−.40	−.40	.26	.28	.44	.53	.46
Day School	79	.00	−.07	−.05	−.11	−.08	−.06	−.04	−.28	−.25	−.17
Full-Time Special Education	184	.19	.25	.23	.31	.32	−.10	−.07	−.25	−.33	−.20
Part-Time Special Education	42	.38	.44	.35	.48	.55	−.48	−.65	−.67	−.85	−.74
Itinerant Program	26	.41	.57	.56	.80	.76	−.68	−.84	−1.01	−1.11	−1.08
Resource Room	23	.39	.56	.64	.84	.79	−.40	−.49	−.83	−.88	−.74
Other	10	.00	.00	.32	.49	.14	−.47	−.63	−.14	−.91	−.72
ALL PROGRAM TYPES	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova		6.72*	11.10*	10.17*	21.02*	21.46*	8.69*	12.88*	25.17*	40.80*	30.19*
Correlations		.21	.27	.29	.40	.37	−.25	−.30	−.42	−.51	−.44

*Significant Beyond The .01 Level

whose hearing impaired children attended preschool and those whose hearing impaired children did not attend such programs.

Type of Present Educational Program. That there are substantial differences in the typical communication patterns at the various types of special educational programs is shown clearly in Table 14. The various programs conducted by local school districts (full-time special classes, part-time special classes, itinerant programs, and resource room programs) all show above average speech use scores, while the special schools for hearing impaired children (residential schools and day schools for the deaf) show less use of speech. This pattern is, for the most part, reversed in the case of sign use, with only the residential schools showing more than average use of signs. The correlations reported were obtained by creating a rough metric of "comprehensiveness of special education services" by assigning the numbers 1 through 7 to the various program types in the order listed in Table 14, then correlating these numbers with the various speech use and sign use scores. Both these correlation coefficients and the F-ratios from the one-way analyses of variance indicate that use of speech and use of signs are both strongly related to the type of educational program in which the child is placed. It is important to note, however, that many characteristics of hearing impaired children, including degree of hearing loss, ethnic background, age, age at onset of hearing loss, family income, and other important factors, vary systematically across educational program types (Karchmer & Trybus, 1977). Communication differences across program types are not, therefore, educational results nor simply the results of differences in policy or preference. Instead, these differences largely reflect the fact that these various types of special educational programs serve very different kinds of hearing impaired children.

Use of Hearing Aids. The use of hearing aids by hearing impaired children was examined in three different contexts: in the classroom, during school activities other than classroom work, and at home or in the dormitory. Information was also sought on the age

TABLE 15: MEAN SPEECH AND SIGN USE BY HEARING AID USE AT HOME OR IN DORM

Hearing Aid Use At Home Or In Dorm	N	Speech: Parent To Student	Speech: Student To Parent	Speech: Teacher To Student	Speech: Student To Teacher	Speech Environment	Signs: Parent To Student	Signs: Student To Parent	Signs: Teacher To Student	Signs: Student To Teacher	Sign Environment
Never	173	−.50	−.55	−.25	−.48	−.57	.24	.29	.33	.44	.38
Sometimes	83	.14	.12	.06	−.10	.07	−.01	.09	.14	.12	.10
Usually	105	.03	.05	−.03	.01	.03	.22	.14	.07	.02	.13
Always	233	.36	.39	.29	.45	.48	−.33	−.34	−.40	−.48	−.46
Not Reported	63										
ALL STUDENTS	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova*		22.39	26.18	10.78	25.77	35.96	11.67	12.16	16.26	26.02	24.15
Correlations		.34	.37	.22	.38	.42	−.22	−.25	−.30	−.38	−.34

*All F Values Are Significant Beyond The .01 Level

at which the child first began to use a hearing aid. The relationship between hearing aid use and speech and sign use showed very much the same pattern for all three hearing aid use contexts, but the relationships were strongest and group differences clearest for hearing aid use at home or in the dormitory. Therefore, Table 15 presents the data on speech use and sign use as related to use of the hearing aid at home or in the dormitory. It is clear that those children whose communication pattern involves more than average use of speech also are consistent users of hearing aids. Conversely, those who tend not to use hearing aids tend to depend more heavily on signs in their communication pattern. Here again, the hearing level of the child is the unseen variable underlying this relationship. Put another way, less severe degrees of hearing loss, greater use of hearing aids, greater emphasis on speech in communication, and less emphasis on signs all occur together and define one cluster of hearing impaired children; profound hearing loss, less use of hearing aids, limited use of speech, and greater use of signs generally occur together and define another cluster of hearing impaired children.

A related consideration is the relationship between the age at which a child first began to use a hearing aid and the speech use and sign use aspects of the communication pattern. Table 16 presents data relevant to this question. Perhaps most significant is the fact that more than half (52%) of the teachers were unable to supply this information. For the remaining half of the group, there is a fairly clear trend for a heavier speech emphasis to be associated with earlier first use of a hearing aid. Such early use is also associated with a general trend for less use of signs. There is a clear reversal of this trend for the oldest age group, those who first wore an aid at age 10 or later. While the reasons for this are not clear from the data, speculation suggests that this may represent a late-onset group whose communication pattern, emphasizing speech and using little signs, was established in childhood before the occurrence of the hearing loss.

Rated Speech Intelligibility. A variable closely related to the previous one is the degree to which a child's speech is intelligible to strangers, as rated by the teacher. This topic has been examined in detail by Jensema, Karchmer, and Trybus (1978), who indicate that the child's hearing level is the major variable related to the intelligibility of the child's speech. With this in mind, the data in Table 17 show that rated intelligibility of speech is another variable which covaries with hearing level, use of hearing aids, and a speech emphasis in the communication pattern. Those children who have "intelligible" or "very intelligible" speech, three-quarters of whom have a less-than-profound hearing loss, also place a heavy emphasis on speech use in communication, with little use of signs. Conversely, those children with less than "intelligible" speech, of whom 72% have a profound loss of hearing, put much more emphasis on the use of signs and less emphasis on the use of speech in their communication pattern. Clearly, the variations in hearing level form the basis for the speech use/speech intelligibility relationship, just as in the case of the speech use/hearing aid use relationship.

Hearing Status of Parents. The last variable to be examined in regard to its relationship with speech and sign use is the hearing status of the parents of the hearing impaired child. There has been substantial attention in the literature to the question of deaf children of deaf parents, but the data here indicate that the issue must be addressed more carefully than that simple formulation suggests. In particular, these data indicate that

TABLE 16: MEAN SPEECH AND SIGN USE BY AGE AT WHICH HEARING AID WAS FIRST USED

		Speech					Signs				
Age At Which Hearing Aid Was First Used	*N*	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Speech Environment	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Sign Environment
< 1	3	.50	.65	.58	.85	.84	−.68	−.16	−.46	−.40	−.51
1	22	.28	.45	.45	.43	.54	−.10	−.10	−.42	−.70	−.35
2	42	.21	.29	.25	.27	.32	−.22	−.21	−.52	−.51	−.42
3	73	.33	.32	.34	.25	.42	−.15	−.17	−.30	−.31	−.24
4	48	−.01	.10	.00	.17	.09	.03	−.08	−.21	−.04	−.10
5	40	.25	.16	.07	.38	.29	−.25	−.28	−.24	−.23	−.29
6	33	.28	.19	.02	.21	.24	−.42	−.29	−.24	−.38	−.39
7	18	−.19	−.20	−.11	.05	−.26	.27	.29	−.10	.08	.30
8	8	−.12	.38	−.62	−.23	−.12	.12	.17	.44	.45	.28
9	10	−.74	−.66	−.58	−.78	−.91	.39	.17	.15	.02	.25
≥ 10	19	.11	.19	.41	.50	.40	−.23	−.41	−.56	−.52	−.49
Not Reported	341										
ALL STUDENTS	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One Way Anova		2.93*	3.57*	2.90*	4.66*	5.93*	1.24	2.10	5.29*	5.96*	4.52*
Correlations		−.14	−.15	−.14	−.09	−.18	.05	.01	.09	.11	.07

*Significant At The .01 Level

TABLE 17: MEAN SPEECH AND SIGN USE BY SPEECH INTELLIGIBILITY

Speech Intelligibility	N	Speech: Parent To Student	Speech: Student To Parent	Speech: Teacher To Student	Speech: Student To Teacher	Speech Environment	Signs: Parent To Student	Signs: Student To Parent	Signs: Teacher To Student	Signs: Student To Teacher	Sign Environment
Very Intelligible	104	.38	.57	.45	.91	.75	−.50	−.62	−.64	−.83	−.78
Intelligible	182	.39	.51	.23	.49	.53	−.34	−.35	−.24	−.32	−.37
Barely Intelligible	141	.04	−.03	−.09	−.15	−.07	.19	.20	.11	.23	.20
Not Intelligible	129	−.44	−.57	−.19	−.60	−.56	.38	.51	.46	.51	.58
Would Not Speak	85	−.74	−.87	−.63	−1.24	−1.09	.46	.43	.39	.44	.54
Not Reported	15										
ALL STUDENTS	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova*		28.12	52.12	15.22	104.70	81.48	20.49	28.79	19.75	15.50	42.82
Correlations		.41	.53	.33	.69	.62	.36	.41	.37	.45	.48

*All F Values Are Significant Beyond The .01 Level

there are more hearing impaired children who have *one* hearing impaired parent and one with normal hearing than there are who have *two* hearing impaired parents. Furthermore, as the data in Table 18 show, these two groups have very different communication patterns. Those children whose parents are not reported to be hearing impaired have communication patterns which are exactly average for the entire group, of which they constitute 91%. Those children who have only one hearing impaired parent are reported to have a communication pattern characterized by well above average amounts of speech use and well below average amounts of sign use. In contrast, the children who have two hearing impaired parents are reported to have a communication pattern which, especially at home, places heavy emphasis on the use of signs and much less emphasis on speech communication. Further attention to these differences will be paid in the final part of this report.

An Overall Analysis. As this section of the report has repeatedly emphasized, many of the variables reported here which show clear relationships with speech use and sign use are also overlapping in their variance. For example, hearing level, hearing aid use, and speech intelligibility form one cluster of variables which are related to communication patterns. Ethnic background and family income form another such cluster; both this cluster and the previous one are related to the educational placement of the hearing impaired child, and this entire complex of variables is related to reported speech use and sign use. While this set of variables, some continuous, others categorical, and almost all intercorrelated, requires some of the most sophisticated methods now available for adequate multivariate analysis, the results of one preliminary analysis will be reported simply to underscore the message that much of the variance in communication patterns can be accounted for by this list of fixed, or relatively fixed, characteristics of the child. A multiple regression analysis was conducted for speech use and one for sign use, in which the appropriate "environment" score was predicted by the linear combination of all the variables reported here. Nonlinear relationships were ignored for this purpose, and the usual methods of creating "dummy" variables were employed where necessary. By this method, the multiple R of all the demographic variables with the speech environment score was .73; a correlation of this magnitude indicates that 53% of the variance in speech environment scores can be accounted for by the combination of demographic variables. The multiple R in the case of the sign environment score was .64, accounting for 41% of the variance in sign environment scores. The important point is that differences in characteristics of the children account for much of the differences in the amounts of speech use and sign use employed by and with them.

TABLE 18: MEAN SPEECH AND SIGN USE BY NUMBER OF HEARING IMPAIRED PARENTS

Hearing Impaired Parent	N	Speech: Parent To Student	Speech: Student To Parent	Speech: Teacher To Student	Speech: Student To Teacher	Speech Environment	Signs: Parent To Student	Signs: Student To Parent	Signs: Teacher To Student	Signs: Student To Teacher	Sign Environment
None Reported	600	.02	.01	−.01	−.03	.00	−.02	−.02	.01	.02	−.01
One	39	.25	.15	.30	.39	.36	−.24	−.16	−.28	−.48	−.32
Two	18	−1.16	−.80	−.28	.05	−.81	1.11	1.08	.22	.29	.91
ALL STUDENTS	657	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F Ratio For One-Way Anova		13.82*	6.42*	2.36	2.91	8.52*	12.67*	11.44*	1.69	4.82*	9.68*

*Significant At The .01 Level

DATA ANALYSIS

PART 3: The Relationship Between Reported Speech and Sign Use and Achievement Test Scores

One of the primary goals of any special education program for hearing impaired children is the academic development of those children, and one of the important questions in the field has long been the relationship between the communication method(s) used with a child and that child's level of educational achievement. Because this study of the communication patterns of hearing impaired children was conducted on a subsample of a national sample of children involved in a project to establish national norms for educational achievement, it was possible to examine the relationships between the communication patterns reported in the surveys of parents and of teachers and the school achievement scores obtained by the children.

Of the 657 children upon whom this report has focused up to this point, 452 were old enough (8 years or above) and otherwise eligible for testing with the Stanford Achievement Test, Special Edition for Hearing Impaired Students (SAT-HI). The SAT-HI covers all of the major school subjects, including science, social studies, etc., but the exact list of subjects covered varies from level to level of the test according to the contents of the curriculum for children at various age and grade levels. Four subtests, however, are included in all six levels of the SAT-HI (vocabulary, reading comprehension, mathematics concepts, and mathematics computation) and thus can be studied across the age and grade levels of the children in this sample.

As part of the national standardization of the SAT-HI, national norms were developed to indicate a child's relative level of achievement by comparison with other hearing impaired children of the same age across the country. These are percentile rank scores which range from 1 to 100. If, for example, a 12-year old student receives a hearing impaired age-based percentile rank of 73 on a particular subtest, it means that her score was equal to or better than the scores of 73% of hearing impaired 12-year-olds in the nation on that test. The development and use of these national data are explained in some detail by Trybus and Karchmer (1977). These national age-based percentile rank scores for hearing impaired students were used as the achievement measure in this study. The mean scores for this sample were found to be 54.0 for vocabulary, 55.3 for reading comprehension, 56.5 for mathematics concepts, and 57.1 for mathematics computation. The students in this sample were therefore slightly above the national average in these areas.

The problem of the manner of representing the relationship between communication method and achievement scores is a thorny one because of the major point which was emphasized in the last section of this report: the complex intercorrelations of the demographic variables among themselves and with the speech use and sign use variables. The speech use and sign use scores cannot be meaningfully correlated directly with the achievement measures because, as Part 2 of this report indicates, hearing impaired children who communicate differently are also different on a wide variety of other educationally significant factors. Thus, for example, children who use much speech and those who use little speech are very different children: the latter group have much more severe hearing losses, are much less likely to have attended preschool, come from lower income families, use a hearing aid less, etc. To say that these two groups differ in achievement scores, therefore, says little about the contribution of communication pattern to those achievement differences.

The major analysis of the relationship between communication use scores and school achievement scores will therefore be in terms of partial correlation coefficients. In other words, the correlation between speech or sign usage and achievement will be calculated with the linear influence of five major variables partialed out. These variables are: hearing level, family income, hearing aid use at home or dormitory, preschool attendance, and type of present educational program. The resulting partial correlations may, therefore, be viewed as correlations corrected for differences in these five major variables. These partial correlation coefficients are presented in Table 19. The average size of these correlations, .14, is statistically significant (i.e., is not effectively equal to zero) for a sample as large as this one; but the strength of the relationship

TABLE 19: PARTIAL CORRELATIONS BETWEEN COMMUNICATION USE AND ACADEMIC ACHIEVEMENT [a]

	Speech					Signs				
Academic Area	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Speech Environment	Parent To Student	Student To Parent	Teacher To Student	Student To Teacher	Sign Environment
Vocabulary	.08	.14	.05	.15	.13	−.06	−.12	−.05	−.05	−.11
Reading Comprehension	.15	.21	.18	.30	.27	−.09	−.18	−.12	−.09	−.17
Mathematics Concepts	.14	.20	.15	.24	.23	−.10	−.15	−.12	−.06	−.15
Mathematics Computation	.14	.20	.14	23	.22	−.09	−.15	−.08	−.02	−.12

[a] Partialed out linear influence of program type, hearing loss, preschool attendence, home/dorm use of hearing aid, and parental income.

represented by correlations of this size is low.

The highest correlation in the table, .30, means that only 9% of the variance in the achievement measure can be accounted for by the variance in the speech use score. The other correlations range downward towards zero, while the average correlation of .14 indicates that less than 2% of the achievement variance can be accounted for by the communication variables. This means that, once the effects of hearing level, family income, hearing aid use at home or dormitory, preschool attendance, and type of present educational program are accounted for, the remaining differences in achievement for groups which differ on communication style (high versus low speech use, and high versus low sign use) are trivial. The very small achievement differences which remain are in favor of those children who use more than average amounts of speech and less than average amounts of signing. As has been the case throughout this report, what differences do exist are more strongly related to variations in speech use than to variations in sign use. In other words, the achievement differences between children who use much signing and those who use little signing are essentially negligible. However, there are clear, though small, achievement differences in favor of those who use much speech compared to those who use less speech.

Another method of examining the communication/achievement relationship is to determine what common dimensions, if any, underlie the set of communication and achievement variables. For this purpose, an iterative principal axis factor analysis with varimax rotation was applied to 12 variables: the eight original speech and sign use variables and the four achievement variables. The speech environment and sign environment scores were not used because they are simply composites of the original speech use and sign use scores.

The clearest simple structure solution emerged when five factors were retained. Table 20 presents the factor loadings which resulted. A total of 72% of the variance among the variables is accounted for by the five orthogonal factors, one related to achievement and four related to communication usage. The first factor is clearly an achievement factor, the second is sign use at home, the third is sign use at school, the fourth speech use at home, and the fifth speech use at school. Perhaps the most important point is that the communication variables do not load highly on the academic achievement score factor (Factor 1).

Since the factors are orthogonal, the major dimension associated with the achievement scores is statistically independent of the other four dimensions which underlie the communication use variables. In other words, the speech use and sign use scores have only a minimal relationship to the achievement factor on which all the achievement measures cluster. In the context of the partial correlation data presented above, this simply provides another view of the major conclusion based on these data: communication use, in itself, has relatively little relationship with a hearing impaired child's school achievement scores.

It is important to remember here the qualifications expressed in the introduction to this report. Foremost among these is that this is a *descriptive, not an experimental* study. In other words, these results indicate that communication methods, in all their diversity as currently practiced across the country, simply do not show much relationship to school achievement test scores. Communication methods do, on the other

TABLE 20: FACTOR ANALYSIS OF SPEECH, SIGN, AND ACHIEVEMENT VARIABLES

Variables		Factor Loadings					
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Proportion of Variance Accounted For By Five Factors (Communality)
Signs	Parent To Student	.08	**.79**	.20	.12	.14	.70
	Student To Parent	.16	**.80**	.26	.15	.16	.78
	Teacher To Student	.12	.24	**.81**	.10	.15	.76
	Student To Teacher	.11	.22	**.88**	.17	.19	.89
Speech	Parent To Student	.14	.11	.10	**.73**	.14	.60
	Student To Parent	.20	.14	.13	**.84**	.14	.80
	Teacher To Student	.14	.14	.13	.09	**.75**	.62
	Student To Teacher	.25	.18	.25	.30	**.74**	.79
Academic Achievement	Vocabulary	**.65**	.08	.09	.10	.06	.46
	Reading Comprehension	**.87**	.09	.12	.15	.19	.83
	Mathematics Concepts	**.90**	.08	.08	.12	.11	.84
	Mathematics Computation	**.79**	.07	.03	.12	.11	.66
Proportion Of Total Data Variance Accounted For		.23	.12	.14	.12	.11	.72

TABLE 21: MEAN ACHIEVEMENT SCORES BY NUMBER OF HEARING IMPAIRED PARENTS

Number of Hearing Impaired Parents	N	Vocabulary	Reading Comprehension	Mathematics Concepts	Mathematics Computation
None	412	53.6	54.7	55.9	56.5
One	26	59.2	60.8	59.6	62.0
Two	14	55.0	63.6	67.7	65.1
ALL GROUPS	452	54.0	55.3	56.5	57.1

hand, show clear relationships to the personal and background characteristics of hearing impaired children. These results do not mean that communication methods can never make a difference. It is entirely possible that an experimental study pitting best practice of Method A against best practice of Method B with two equivalent groups of children could show a superiority of one method or the other in terms of the children's achievement scores. Such a result, were it to occur, would not contradict the results of the present study, since this study examines the present use of speech, not "best practice" of speech, and present use of signs, not "best practice" of signing. The results of Part 2 of this report, however, seem to suggest that it would be extremely difficult at best to locate two groups of hearing impaired children who differed in communication usage but not on the list of educationally significant variables examined there.

One final set of data which relate to communication patterns and achievement test scores in hearing impaired children is presented in Table 21. This table shows the mean age-based percentile ranks for children with one, two, or no hearing impaired parents on the four achievement subtests. In all cases, *both* groups of children with one or two hearing impaired parents have higher mean scores than the children with no hearing impaired parents. However, these two groups of children have very different communication styles. Those children with two hearing impaired parents rely heavily on signs and use little speech; those children with one hearing impaired parent, by contrast, depend very heavily on speech and make very little use of signs. The group with no hearing impaired parents are, therefore, somewhere between these two groups in terms of communication styles; yet both groups with hearing impaired parents outperform the middle group, even though they employ markedly different communication strategies. This suggests, again, that variables other than communication method are operating to give both of these groups a performance advantage over children with hearing parents.

Taken all together, then, the available data suggest that while factors such as the child's hearing level and the family's income level have a large influence on the child's school achievement, variations in communication methods, specifically in the amount of speech used and the amount of signs used, have little relationship with achievement scores, given the existing national variations in the quantity and quality of use of those methods.

SUMMARY AND CONCLUSION

If you have turned to this summary in order to get the results of this study "in a nutshell," you are continuing a pattern which has caused substantial grief over the course of many years in the field of education of hearing impaired children. This pattern is an attempt to reduce complex issues to simple "either/or" formulations and to avoid the labor of reading and understanding the detailed report of methods, qualifications, and interrelationships in favor of a quick jump to the "bottom line."

What we have tried to do in this report is to insist that this subject cannot be properly understood and evaluated except in its complexity—the complexity of the national situation as it is in its present reality, and the complexity of the methods, procedures, and judgments involved in conducting and reporting on a project of the sort described here.

Large amounts of effort in our field have been devoted to the consideration of the educational effects of using one group of muscles rather than another to convey messages to hearing impaired children. Our work has convinced us, however, that relatively fixed and unchangeable factors presently have the greatest impact on the educational achievement of hearing impaired children. If this report encourages any of its readers to shift their attention and efforts to materials, *teaching* methods, attitudinal and cognitive factors, and the like in an attempt to undo the influence of the fixed factors, we shall consider our work here a success.

REFERENCE NOTE

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Appendices

Appendix 1: Annual Survey Basic Data Form, 1973-74, and Family and Teacher Questionnaires

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OFFICE OF DEMOGRAPHIC STUDIES
Gallaudet College, Washington, D.C.

ASHICY 2 (74)

APPENDIX 1
BASIC DATA FORM

ANNUAL SURVEY OF HEARING IMPAIRED CHILDREN AND YOUTH
1973-74 School Year

CONFIDENTIAL: All information which would permit identification of any individual or institution will be held strictly confidential and will be used only by persons engaged in the survey for preparing statistical summaries. The data will not be disclosed to others for any other purpose.

I. IDENTIFYING INFORMATION

A. 1. Name of Student or Code Number _____ (Last) (First) (Middle) 2. Date of Birth _____ (Mo., Day, Yr.) 3. Sex ☐ M ☐ F

4. Residence _____ (City) (County) (State)

B. Present School or Agency _____ (Name) (Street) (City)

II. SPECIAL EDUCATIONAL PROGRAM

A. IS THIS STUDENT IN A SPECIAL UNIT FOR MULTIPLY HANDICAPPED STUDENTS? ☐ Yes ☐ No

B. Indicate the type of special educational program in which this student is enrolled related to his hearing loss by checking alternatives 1., 2., 3. or 4 below. Then complete the section in the category you have checked where applicable.

1. ☐ RESIDENTIAL PROGRAM
   a. ☐ School for Deaf Students ☐ School for Multiply Handicapped Students
   b. Is the student: ☐ Residential ☐ Day
2. ☐ DAY SCHOOL (No Hearing Students in the Building)
3. ☐ DAY CLASSES & SERVICES FOR DEAF OR HARD OF HEARING STUDENTS
   - ☐ Full-time Special Educational Classes _____ : _____ Hrs./Week
   - ☐ Part-time Special Educational Classes _____ : _____ Hrs./Week
   - ☐ Itinerant Program _____ : _____ Hrs./Week
   - ☐ Resource Room _____ : _____ Hrs./Week
   - ☐ Other (specify) _____ : _____ Hrs./Week
4. ☐ SPEECH & HEARING CLINICAL SERVICES
   Type (specify) _____ : _____ Hrs./Week

III. HEARING LOSS

A. AUDIOLOGICAL FINDINGS

1. Air Conduction Test (If Air Conduction Results Are Not Available, Go to III. A. 2.)
   a. Standard Used: ☐ ISO ☐ ASA b. Date Tested: _____
   Note: If Sound Field Examination, Check Here: ☐

	RIGHT EAR								LEFT EAR							
Frequency	125	250	500	1000	2000	4000	6000	8000	125	250	500	1000	2000	4000	6000	8000
Hearing Level																

If results are not reported at 500, 1000, and 2000 Hz for both ears, complete III. A. 2.

2. Check the box beside the statement which best describes the student's hearing loss.
   - ☐ Normal Limits (Less than 27 dB ISO)
   - ☐ Mild (27-40 dB ISO)
   - ☐ Moderate (41-55 dB ISO)
   - ☐ Moderately Severe (56-70 dB ISO)
   - ☐ Severe (71-90 dB ISO)
   - ☐ Profound (91 dB plus ISO)

B. AGE AT ONSET OF HEARING LOSS
   ☐ At Birth _____ Years of Age ☐ Unknown

C. CAUSE OF HEARING LOSS
   ☐ Cause Cannot Be Determined ☐ Data Not Available in Student's Record

1. If onset at birth, what was the probable cause? (Check all that apply.)
   ☐ Maternal Rubella ☐ Other Complications of Pregnancy ☐ Prematurity ☐ Rh Incompatibility
   ☐ Trauma at Birth ☐ Heredity ☐ Other (specify) _____

2. If onset after birth, what was the probable cause? (Check all that apply.)
   ☐ Meningitis ☐ Mumps ☐ Measles ☐ Otitis Media ☐ Trauma
   ☐ High Fever ☐ Infections ☐ Other (specify) _____

IV. ADDITIONAL HANDICAPPING CONDITIONS

Check all educationally significant handicapping conditions: If none, check here ☐

☐ Epilepsy	☐ Visual Problem	☐ Perceptual-Motor Disorder
☐ Brain Damage	☐ Mental Retardation	☐ Heart Disorder
☐ Orthopedic	☐ Cerebral Palsy	☐ Emotional-Behavioral Problem

☐ Other (specify) _____

V. ETHNIC BACKGROUND

☐ White	☐ Spanish-American	☐ Oriental	☐ Unknown	☐ Cannot Report
☐ Negro or Black	☐ American Indian	☐ Other (specify) _____		

COMMENTS:

OFFICE OF DEMOGRAPHIC STUDIES
Gallaudet College, Washington, D.C.

ASHICY-5 (74)

FAMILY QUESTIONNAIRE
ANNUAL SURVEY OF HEARING IMPAIRED CHILDREN & YOUTH

CONFIDENTIAL: All information which would permit identification of any individual or institution will be held strictly confidential and will be used only by persons engaged in the survey for preparing statistical summaries. The data will not be disclosed to others for any other purpose.

I. IDENTIFYING INFORMATION

INSTRUCTIONS FOR COMPLETING FAMILY QUESTIONNAIRE

The following questions relate only to the parents or guardians and the brothers and sisters in the family household of which the above named child is a member. If you have no spouse presently living in your household, complete only those questions which pertain to you and your children. All questions in Section III. refer to your child named above, not to his brothers and sisters.

If the child named above is adopted, would you please check here: ☐

II. BROTHERS AND SISTERS

Please give the name of each of your children below (including those who have grown up and since moved away) and fill in the appropriate information on age, sex and hearing status for each beside his/her name. Be sure to include the child named above. Also, if any are stepbrothers or stepsisters to this child, please write "(S)" after their names.

Name	*Birthdate*	*Sex*	*Does This Child Have A Hearing Problem?*
_____	_____	☐ M ☐ F	☐ Yes ☐ No
_____	_____	☐ M ☐ F	☐ Yes ☐ No
_____	_____	☐ M ☐ F	☐ Yes ☐ No
_____	_____	☐ M ☐ F	☐ Yes ☐ No
_____	_____	☐ M ☐ F	☐ Yes ☐ No
_____	_____	☐ M ☐ F	☐ Yes ☐ No
_____	_____	☐ M ☐ F	☐ Yes ☐ No
_____	_____	☐ M ☐ F	☐ Yes ☐ No

III. INFORMATION ON HEARING IMPAIRED CHILD

ANSWER THESE QUESTIONS ABOUT YOUR HEARING IMPAIRED CHILD WHOSE NAME APPEARS IN SECTION I.

A. 1. At What Age Was Your Child When You *Discovered* His/Her Hearing Loss?
☐ At Birth _____ Years of Age

2. At What Age Did Your Child *Lose* His/Her Hearing?
☐ At Birth _____ Years of Age ☐ Age Lost Hearing Unknown

B. Early Training

1. Did your hearing impaired child ever attend a nursery or preschool program?
☐ Yes (Complete B.2. and 3.) ☐ No (Go to C.)
2. At what age was your child first enrolled in this program? _____ Years of Age
3. Was this first program a special program for the hearing impaired? ☐ Yes ☐ No

C. Does Your Child Wear A Personal Hearing Aid?
☐ Yes (Complete C.1.-3.) ☐ No (Go to D.)

1. Where is the hearing aid worn? ☐ Above the Neck ☐ Below the Neck
2. Is the hearing aid worn in one or both ears? ☐ One Ear ☐ Both Ears
3. On the average, when at home, how much of the day does your child wear the aid?
☐ Rarely ☐ Usually
☐ Sometimes ☐ Always (excluding sleeping, bathing, etc.)

D. Communication In The Home

1. What method of communication do *you use* most often when communicating with your hearing impaired child?
☐ Speech ☐ Sign Language ☐ Fingerspelling ☐ Writing
☐ Gestures ☐ Other (describe) _____
2. What method of communication does your hearing impaired *child use* when he/she communicates with you?
☐ Speech ☐ Sign Language ☐ Fingerspelling ☐ Writing
☐ Gestures ☐ Other (describe) _____
3. Is a language other than English regularly spoken in the home? ☐ Yes ☐ No
If "Yes" what language? _____

IV. PARENT INFORMATION

ALL QUESTIONS IN THIS SECTION ARE FOR THE PRESENT PARENTS OR GUARDIANS OF THE HEARING IMPAIRED CHILD WHOSE NAME APPEARS IN SECTION I.

A. Age of Parents or Guardians

1. Mother's Age: _____ Years of Age 2. Father's Age: _____ Years of Age

B. Hearing Status of Parents or Guardians

1. Mother's Hearing
   - ☐ Normal Hearing
   - ☐ Hearing Impaired (or deaf): Please give age lost hearing. _____ Years of Age
2. Father's Hearing
   - ☐ Normal Hearing
   - ☐ Hearing Impaired (or deaf): Please give age lost hearing. _____ Years of Age

C. What Is the Highest Grade You and Your Spouse Completed in School?
(Check the appropriate box and then circle the last grade completed.)

Mother	*Father*
☐ None	☐ None
☐ Elementary: 1 2 3 4 5 6 7 8	☐ Elementary: 1 2 3 4 5 6 7 8
☐ High School: 1 2 3 4	☐ High School: 1 2 3 4
☐ Vocational or Secretarial: 1 2 3 4	☐ Vocational or Secretarial: 1 2 3 4
☐ College/University: 1 2 3 4 5+	☐ College/University: 1 2 3 4 5+

D. Parents' Occupations

1. Father's Occupation
   a. What is the *usual* occupation of the father? _____
   b. What is the *current* occupation of the father? _____
      ☐ Same As Above ☐ Unemployed ☐ Other (describe) _____
   c. Does the father currently work for:
      - ☐ Himself (self employed)
      - ☐ Business or Industry
      - ☐ Government (local, state or federal)
2. Mother's Occupation
   a. What is the *usual* occupation of the mother?
      - ☐ Full-time Housewife (Go to E.)
      - ☐ Other (describe) _____
   b. What is the *current* occupation of the mother?
      ☐ Same As Above ☐ Unemployed ☐ Other (describe) _____
   c. Does the mother currently work for:
      - ☐ Herself (self employed)
      - ☐ Business or Industry
      - ☐ Government (local, state or federal)

E. Please Check the Appropriate Box Indicating Your Total, Combined Family Income for the Past Twelve (12) Months.

☐ Under $5,000	☐ $10,000 - $14,999	☐ $20,000 and Over
☐ $5,000 - $9,999	☐ $15,000 - $19,999	

COMMENTS

SPECIAL STUDIES QUESTIONNAIRE
ANNUAL SURVEY OF HEARING IMPAIRED CHILDREN AND YOUTH

INSTRUCTIONS FOR COMPLETING SPECIAL STUDIES QUESTIONNAIRE

Please complete this questionnaire for the student whose name appears on page two. All questions should be answered as accurately and completely as possible. If the information is not known for a particular question, please check the box marked "Do Not Know" where it has been provided or write "DNK" beside the question.

Where a question is answered as "Never," "Sometimes," "Usually" or "Always," the following percentages are offered as guidelines:

NEVER = 10% of the time or less
SOMETIMES = 11% - 50% of the time
USUALLY = 51% - 90% of the time
ALWAYS = 91% of the time or more

Several questions relate totally to the teacher's observations of this student in her classroom. These particular questions have been marked with an asterisk (*) and should only be completed by the student's teacher.

After the questionnaire has been completed, please return it directly to the Survey Office in the envelope which has been provided.

CONFIDENTIAL: All information which would permit identification of any individual or institution will be held strictly confidential and will be used only by persons engaged in the survey for preparing statistical summaries. The data will not be disclosed to others for any other purpose.

HEARING AID USAGE

*I. HEARING AID USAGE IN THE CLASSROOM

Does the student use a hearing aid (personal/group) in the classroom?
☐ Yes (Complete A & B) ☐ No (Go to II.)

A. Of the _____ hours per day the student is in the classroom, he/she uses a hearing aid (group/personal) for _____ hours.

B. What type of aid does the student usually use in the classroom?
☐ Personal: ☐ Student owns the aid; ☐ Personal aid supplied by the school
☐ Group: Please specify type of group aid; ☐ Headset ☐ Wireless Set

*II. HEARING AID USAGE OUTSIDE THE CLASSROOM

A. Outside the classroom, but while at school, how often does the student use a personal hearing aid (excluding inappropriate times such as football, swimming etc.).
☐ Never ☐ Sometimes ☐ Usually ☐ Always

B. At home or in the dormitory, to your knowledge, how often does the student use a personal hearing aid (excluding inappropriate times such as sleeping etc.)?
☐ Never ☐ Sometimes ☐ Usually ☐ Always

FOR CURRENT USER OF AN AID, COMPLETE III. FOR CURRENT NON-USER OF AN AID, COMPLETE IV.

*III. CURRENT USERS OF PERSONAL AIDS

A. Is the personal aid: ☐ Monaural ☐ Binaural ☐ Y Cord

B. Has the student had the hearing aid he is now using for more than one year?
☐ Yes ☐ No ☐ Do Not Know

C. Has the performance of that hearing aid been evaluated by an audiologist during the past year?
☐ Yes ☐ No ☐ Do Not Know

D. Does your program have a "trouble shooting" procedure to check the student's aid for broken cords, dead batteries, etc.?
☐ Yes (Complete 1. and 2.) ☐ No (Gv to E.)
1. How often would this student's aid be checked through this procedure?
☐ Daily ☐ Weekly ☐ Monthly ☐ Other (specify) _____
2. Who would perform the "trouble shooting" procedure on this student's aid?
☐ Audiologist ☐ Teacher ☐ Audiometrist ☐ School Nurse
☐ Other (specify) _____

E. When the student's aid is not working or is being repaired, is a "loaner aid" available for his use during this time?
☐ Yes ☐ No ☐ Do Not Know

F. When did this student begin wearing a hearing aid?
_____ Years of Age ☐ Do Not Know (Go to F.3.)
1. When the student first began to use an aid, did he/she receive training in the use of the aid within six months of that time?
☐ Yes ☐ No ☐ Do Not Know
2. Has the aid been tested and evaluated at least once a year since the student began using the hearing aid?
☐ Yes ☐ No ☐ Do Not Know
3. If any or all of the information is not available to complete F.1. and 2., please describe the student's hearing aid usage during the time you have known him/her: include the length of time you have known the student, how much of that time he/she has used an aid, use of audiological services and a brief evaluation of the student's use of the hearing aid.

IV. CURRENT NON-USERS OF PERSONAL AIDS

A. Did this student ever use a personal hearing aid?
☐ Yes (Complete B., C. & D.) ☐ No (Go to V.) ☐ Do Not Know (Go to V.)

B. 1. When did this student first begin using a hearing aid? _____ Years ☐ Do Not Know
2. When did this student stop using a hearing aid? _____ Years ☐ Do Not Know
3. Why did this student stop using a hearing aid? _____

_____

4. Between the time this student started and stopped using a hearing aid, how often did he/she use the aid (excluding inappropriate times)?
☐ Sometimes ☐ Usually ☐ Always ☐ Do Not Know

C. During the first six months the student began using an aid, did he/she receive training in the use of the hearing aid?
☐ Yes ☐ No ☐ Do Not Know

D. During the period the student used an aid, was the performance of the hearing aid tested and evaluated at least once a year?
☐ Yes ☐ No ☐ Do Not Know

V. AUDIOLOGICAL INFORMATION

A. Is the student capable of responding to a speech discrimination test?
☐ Yes (Complete 1. & 2.) ☐ No (Go to B.)
1. What is the student's *aided* speech discrimination score? _____
2. What is the student's *unaided* speech discrimination score? _____

B. Is the student capable of responding to a speech reception threshold test?
☐ Yes (Complete 1. & 2.) ☐ No (Go to C.)
1. What is the student's *aided* hearing level for spondaic words? _____
2. What is the student's *unaided* hearing level for spondaic words? _____

C. 1. What is the student's *aided* speech awareness level? _____
2. What is the student's *unaided* speech awareness level? _____

D. 1. Please record the student's *unaided* pure tone air conduction results at 500, 1000 and 2000 Hz for both ears.

		Right Ear	*Left Ear*
☐ ISO	500	_____	_____
☐ ASA	1000	_____	_____
Date of the Test: _____	2000	_____	_____

*2. If results are not reported at 500, 1000 and 2000 Hz for both ears, please check the box beside the statement which best describes the student's *unaided* hearing loss.

☐ Normal Limits (Less than 27dB ISO)
☐ Mild (27-40dB ISO)
☐ Moderate (41-55dB ISO)
☐ Moderately Severe (56-70dB ISO)
☐ Severe (71-90dB ISO)
☐ Profound (91dB plus ISO)

COMMUNICATION USAGE

PLEASE ANSWER THE FOLLOWING QUESTIONS INDICATING THE DEGREE TO WHICH THE LISTED METHODS OF COMMUNICATION ARE USED IN THE VARIOUS SITUATIONS. ALL OF THESE QUESTIONS SHOULD BE COMPLETED BY THE STUDENT'S TEACHER.

*I. STYLE OF COMMUNICATION IN THE CLASSROOM

A. Teacher Communicating to the Student

To what degree do *you use* each of the following styles of communication when you are teaching the class in which this student is a member?

Style of Communication	Never	Sometimes	Usually	Always
Cued Speech Method	☐	☐	☐	☐
Speech (Without Cues)	☐	☐	☐	☐
Manual Signs (Including Fingerspelling)	☐	☐	☐	☐
Fingerspelling (with No Manual Signs)	☐	☐	☐	☐
Gestures or Pantomime	☐	☐	☐	☐
Writing (Excluding Blackboard)	☐	☐	☐	☐
Other (Please Specify) _____	☐	☐	☐	☐

B. Student Communicating to the Teacher

To what degree does the *student use* each of the following styles of communication when he/she communicates to you, the teacher, in routine classroom activity.

Style of Communication	Never	Sometimes	Usually	Always
Cued Speech Method	☐	☐	☐	☐
Speech (Without Cues)	☐	☐	☐	☐
Manual Signs (Including Fingerspelling)	☐	☐	☐	☐
Fingerspelling (with No Manual Signs)	☐	☐	☐	☐
Gestures or Pantomime	☐	☐	☐	☐
Writing (Excluding Blackboard)	☐	☐	☐	☐
Other (Please Specify) _____	☐	☐	☐	☐

*II. STUDENT COMMUNICATING WITH OTHER STUDENTS

A. This Student Communicating With Other Deaf Students

To what degree does this *student use* each of the following styles of communication when communicating to other deaf students outside the classroom?

Style of Communication	Never	Sometimes	Usually	Always
Cued Speech Method	☐	☐	☐	☐
Speech (Without Cues)	☐	☐	☐	☐
Manual Signs (Including Fingerspelling)	☐	☐	☐	☐
Fingerspelling (with No Manual Signs)	☐	☐	☐	☐
Gestures or Pantomime	☐	☐	☐	☐
Writing	☐	☐	☐	☐
Other (Please Specify) _____	☐	☐	☐	☐

B. This Student Communicating With Hearing Students

To what degree does this *student use* each of the following styles of communication when communicating with hearing students (if any) outside the classroom?

Style of Communication	Never	Sometimes	Usually	Always
Cued Speech Method	☐	☐	☐	☐
Speech (Without Cues)	☐	☐	☐	☐
Manual Signs (Including Fingerspelling)	☐	☐	☐	☐
Fingerspelling (with No Manual Signs)	☐	☐	☐	☐
Gestures or Pantomime	☐	☐	☐	☐
Writing	☐	☐	☐	☐
Other (Please Specify) _____	☐	☐	☐	☐

*III. OTHER STUDENTS COMMUNICATING WITH THIS STUDENT

A. Other Deaf Students Communicating With This Student

To what degree do *other deaf students use* each of the following styles of communication when communicating with this student outside the classroom?

Style of Communication	Never	Sometimes	Usually	Always
Cued Speech Method	☐	☐	☐	☐
Speech (Without Cues)	☐	☐	☐	☐
Manual Signs (Including Fingerspelling)	☐	☐	☐	☐
Fingerspelling (with No Manual Signs)	☐	☐	☐	☐
Gestures or Pantomime	☐	☐	☐	☐
Writing	☐	☐	☐	☐
Other (Please Specify) _____	☐	☐	☐	☐

B. To what degree to other *hearing students* (if any) *use* the following styles of communication when communicating with this student outside the classroom?

Style of Communication	Never	Sometimes	Usually	Always
Cued Speech Method	☐	☐	☐	☐
Speech (Without Cues)	☐	☐	☐	☐
Manual Signs (Including Fingerspelling)	☐	☐	☐	☐
Fingerspelling (with No Manual Signs)	☐	☐	☐	☐
Gestures or Pantomime	☐	☐	☐	☐
Writing	☐	☐	☐	☐
Other (Please Specify) _____	☐	☐	☐	☐

*IV. SPEECH INTELLIGIBILITY

How do you, the teacher, think the average hearing person with whom this student might come in contact outside of school (i.e. bus driver, clerk in a store, etc.) would classify this student's speech?

- ☐ Very Intelligible (very similar to the speech of a hearing person of the same age)
- ☐ Intelligible (somewhat difficult to understand)
- ☐ Barely Intelligible (can only understand after repetition and use of other cues)
- ☐ Not Intelligible
- ☐ Student Would Not Ordinarily Attempt to Use Speech

GENERAL INFORMATION

I. EARLY TRAINING

A. Prior to age six, was this student enrolled in a parent/child program?
☐ Yes (Complete 1. & 2.) ☐ No (Go to B.) ☐ Do Not Know (Go to B.)

1. At what age did this student enroll in a parent/child program?
_____ Years of Age ☐ Do Not Know

2. Did the parents attend demonstration sessions in the use of the hearing aid?
☐ Yes (Complete a. and b.) ☐ No (Go to B.) ☐ Do Not Know (Go to B.)

a. Where were these demonstration sessions conducted?
☐ At Home ☐ At a School or Agency ☐ Do Not Know

b. What was the profession of the person who conducted the sessions?

B. Prior to age six, did this student attend a preschool program?
☐ Yes (Complete 1.-3.) ☐ No (Go to II.) ☐ Do Not Know (Go to II.)

1. At what age did the student first enroll in a preschool program?
_____ Years of Age ☐ Do Not Know

2. Was this first program a special educational preschool for hearing impaired children?
☐ Yes ☐ No ☐ Do Not Know

3. Did hearing children attend this preschool?
☐ Yes ☐ No ☐ Do Not Know

*II. ADDITIONAL HANDICAPPING CONDITIONS

A. Please check all educationally significant handicapping conditions and indicate the degree of educational significance.

	Degree of Significance		
	Mild	Moderate	Severe
☐ Visual Problem	☐	☐	☐
☐ Brain Damage	☐	☐	☐
☐ Cerebral Palsy	☐	☐	☐
☐ Epilepsy	☐	☐	☐
☐ Heart Disorder	☐	☐	☐
☐ Mental Retardation	☐	☐	☐
☐ Orthopedic	☐	☐	☐
☐ Perceptual-Motor Disorder	☐	☐	☐
☐ Emotional or Behavioral Problems	☐	☐	☐
☐ Other (specify) _____	☐	☐	☐
_____	☐	☐	☐

B. Medication

1. Is this student on regular, prescribed medication for any of the conditions listed in II.A.?
☐ Yes ☐ No ☐ Do Not Know

2. If "Yes," please specify the condition(s) for which the student is on medication.
_____

III. INTELLIGENCE TEST

A. Please give the results of this student's most recent intelligence test.

Description of Test		IQ Scores		
Name	Level/Form	Non-Verbal/Performance	Verbal	Total

Date IQ Test Administered: _____

B. What was the profession of the person who administered this IQ test?
☐ Psychologist ☐ Psychometrist ☐ Counselor ☐ Physician (M.D.)
☐ Teacher ☐ Other (specify) _____

*IV. HANDEDNESS

A. In most activities, is this student:
☐ Right Handed ☐ Left Handed ☐ Ambidextrous

B. In writing, specifically, is this student:
☐ Right Handed ☐ Left Handed ☐ Ambidextrous

V. INFORMATION ON THE STUDENT'S FAMILY

A. Family History of Hearing Impairement
Indicate the hearing status of the members of the student's immediate family.

FATHER (check one)	*MOTHER* (check one)	*SIBLINGS* (do not include student)
☐ Normal Hearing	☐ Normal Hearing	Total Number _____
☐ Hearing Impaired	☐ Hearing Impaired	Number Normal Hearing _____
☐ Data Not Available	☐ Data Not Available	Number Hearing Impaired _____
	☐ Data Not Available	

B. Financial Information
Please give your best estimate of the total, combined family income of this student's household for the past twelve (12) months.
☐ Under $5,000 ☐ $10,000 - $14,999 ☐ $20,000 and Over
☐ $5,000 - $9,999 ☐ $15,000 - $19,999

TEACHER INFORMATION

1. How many years have you been teaching hearing impaired children? _____ Years
2. How long have you been teaching at this particular school? _____ Years
3. Are you: ☐ Hearing ☐ Hard of Hearing ☐ Deaf

We sincerely wish to thank you again for your cooperation in completing this questionnaire. If you wish to receive a copy of the report from this study please complete the enclosed "Request For Copy of Report" form and return it with this questionnaire or drop it in the mail at some later date.

APPENDIX 2

COMPARISON OF CHARACTERISTICS OF STUDENTS IN PRESENT STUDY WITH THOSE OF STUDENTS IN 1973-74 NATIONAL ACHIEVEMENT TEST STANDARDIZATION PROGRAM

TABLE A-1: AGE

Year of Birth	Subsample N	Subsample %	National Sample N	National Sample %
1968 or later	64	9.7	895	8.4
1965-67	144	21.9	2,143	20.4
1962-64	180	27.4	2,928	27.9
1959-61	110	16.7	1,992	19.0
1956-58	117	17.8	1,930	18.4
1955 or before	42	6.4	621	5.9
Totals	657	100.0	10,509	100.0

X^2 (df = 5) = 4.43, not significant

TABLE A-2: SEX

Sex	Subsample N	Subsample %	National Sample N	National Sample %
Male	354	53.9	5,642	53.7
Female	303	46.1	4,864	46.3
Totals	657	100.0	10,506[1]	100.0

[1]the sex of 3 students was unknown
X^2 (df = 1) = .006, not significant

TABLE A-3: TYPE OF EDUCATION PROGRAM

Program Type	Subsample N	Subsample %	National Sample N	National Sample %
Residential School	293	44.6	4,093	38.9
Day School	79	12.0	1,488	14.2
Full-Time Classes	184	28.0	2,921	27.8
Part-Time Classes	42	6.4	531	5.1
Itinerant Program	26	4.0	777	7.4
Resource Room	23	3.5	330	3.1
Other	10	1.5	369	3.5
Totals	657	100.0	10,509	100.0

X^2 (df = 6) = 27.9, $p < .05$

TABLE A-4: HEARING LEVEL

Hearing Level (BEA)	Subsample N	Subsample %	National Sample N	National Sample %
Normal (< 27 dB, ISO)	8	1.2	216	2.1
Mild (27-40 dB, ISO)	11	1.7	382	3.6
Moderate (41-55 dB, ISO)	46	7.0	704	6.7
Moderately Severe (56-70 dB, ISO)	73	11.1	1,248	11.9
Severe (71-90 dB, ISO)	173	26.3	2,689	25.6
Profound (>90 dB, ISO)	319	48.6	4,873	46.4
Not Reported	27	4.1	397	3.8
Totals	657	100.0	10,509	100.0

X^2 (df = 6) = 10.97, not significant

TABLE A-5: AGE AT ONSET OF HEARING LOSS

Age at Onset	Subsample N	Subsample %	National Sample N	National Sample %
Before age 1	484	73.7	7,247	68.9
Age 1	36	5.5	603	5.7
Age 2	32	4.9	427	4.1
Age 3 or later	25	3.8	579	5.6
Unknown	80	12.2	1,653	15.7
Totals	657	100.0	10,509	100.0

X^2 (df = 4) = 12.1, $p < .05$

TABLE A-6: ADDITIONAL HANDICAPPING CONDITIONS

Number of AHC's	Subsample N	Subsample %	National Sample N	National Sample %
None reported	471	71.7	7,601	72.3
One	121	18.4	1,977	18.8
Two	45	6.8	637	6.1
Three	12	1.8	212	2.0
Four or more	8	1.2	82	0.8
Totals	657	100.0	10,509	100.0

X^2 (df = 4) = 2.61, not significant

TABLE A-7: ETHNIC BACKGROUND

Ethnic Background	Subsample N	Subsample %	National Sample N	National Sample %
White	455	69.3	6,852	65.2
Black	97	14.8	1,893	18.0
Spanish-American	74	11.3	1,201	11.4
Other	4	0.6	129	1.2
Not reported	27	4.1	434	4.1
Totals	657	100.0	10,509	100.0

X^2 (df = 4) = 7.45, not significant

APPENDIX 3

LIST OF SCHOOLS PARTICIPATING IN THE 1973-74 NATIONAL ACHIEVEMENT TEST STANDARDIZATION PROGRAM

ALABAMA
- Children's Center of Montgomery
- Springhill Presbyterian Church
- West Athens Elementary

ARIZONA
- Arizona School for the Deaf
- Phoenix Elementary School District #1

ARKANSAS
- Jenkins Memorial Children's Center

CALIFORNIA
- Alhambra City & High School District
- Alum Rock Union Elementary School District
- Carlsbad Unified School District
- Centralia School District
- Escondido Union School District
- Fremont Union High School District
- Glendale Unified School District
- Hanford Elementary School District
- Madera County Schools
- Monache High School
- Newport-Mesa Unified School District
- Oakland Unified School District
- Oralingua School for Hearing Impaired
- Orcutt Union School District
- Pomona Unified School District
- San Francisco Hearing & Speech Center
- Selaco-Downey
- Simi Valley Unified School District
- Stockton Unified School District
- Union School District, Oster School

COLORADO
- Greeley Public Schools (Bishop Lehr School)
- Colorado Springs Public School District #11

CONNECTICUT
- Blackham School
- Woodward School

DELAWARE
- Margaret Sterck School for the Deaf

FLORIDA
- Florida School for the Deaf
- Brevard County Schools
- Dade County Schools
- Robert McCord Oral School
- Okaloosa County Schools

GEORGIA
- Clarke County Schools
- DeKalb County Program
- Spalding-Griffin County Schools
- Valdosta Public Schools

ILLINOIS
- Rockford Public Schools
- Shields School
- Springfield Public School District #186
- James Ward Elementary School
- Ella Flagg Young School
- Williamson County, Project Action

INDIANA
- Marion Community Schools
- Hammond Public Schools

IOWA
- Cedar Rapids Community Schools

KANSAS
- Lawrence-Grant Unified School District #497

KENTUCKY
- Kentucky School for the Deaf
- Covington Independent Schools

LOUISIANA
- Louisiana State School, Southern Branch
- Jefferson Parish Schools
- Lafayette Parish Schools

MARYLAND
- Baltimore City Public Schools

MASSACHUSETTS
- Duxbury Public Schools
- Killam School, Reading

MICHIGAN
- Lutheran School for the Deaf
- Ann Arbor Public Schools
- Battle Creek Public Schools
- Branch County Intermediate School District
- Holland Public Schools
- Ida Public Schools
- Ionia County Intermediate School District
- Lakeview Public Schools
- Utica Community Schools

MINNESOTA
- Minnesota School for the Deaf
- Anoka-Hennepin Intermediate School District #11
- Minneapolis Public Schools

MISSOURI
- Missouri School for the Deaf
- St. Joseph School District

NEVADA
- Washoe County Schools

NEW HAMPSHIRE
- Crotched Mountain School for the Deaf

NEW JERSEY
- Bloomfield Public Schools
- Elizabeth Public Schools
- Toms River Schools
- Morris County Board of Education, Lake Drive School

NEW YORK
- New York School for the Deaf, Rome
- Albany, Schoharie, Schenectady County Schools
- Buffalo Public Schools
- Hebrew Institute for the Deaf
- Junior High School 47 School for the Deaf
- St. Joseph's School for the Deaf
- Syracuse City School District

NORTH CAROLINA
- Gaston County Classes for the Hearing Impaired
- Mecklenberg Schools

OHIO
- Millridge Center for Hearing Impaired Children
- Springfield City Schools
- Trumbull County Schools
- Youngstown Public Schools
- Dayton Public Schools (Patterson-Kennedy School for the Deaf)

OKLAHOMA
- Jane Brooks School for the Deaf
- Shawnee Public Schools

OREGON
- Oregon State School for the Deaf
- Tucker-Maxon Oral School

PENNSYLVANIA
- Erie City School District
- Philadelphia Public Schools
- Fayette County Intermediate Unit 1
- Allegheny Intermediate Unit 3

SOUTH CAROLINA
- Aiken County School District
- Fairfield County Schools
- Greenwood District #50
- Richland County School District

TEXAS
- Texas School for the Deaf
- Dallas Regional Day School for the Deaf
- Hereford Independent School District
- Lubbock Independent School District
- Wakefield Elementary-Sherman Independent School District
- Sunshine Cottage School
- Tarrant County Day School

UTAH
- Granite School District
- Nebo School District

VIRGINIA
- Virginia School for the Deaf, Hampton
- Portsmouth Diagnostic, Adjustive, Corrective Center

WASHINGTON
- Bremerton School District
- Longview School District #122
- Edna Davis School

WISCONSIN
- Eau Claire Area Public Schools

APPENDIX 4

OFFICE OF DEMOGRAPHIC STUDIES
GALLAUDET COLLEGE

BACKGROUND AND PURPOSE

The purpose of the Office of Demographic Studies and its Annual Survey of Hearing Impaired Children and Youth is to provide, on a national scale, information and data-oriented services which can assist in improving and expanding the educational opportunities available to hearing impaired persons. In order to develop this information and provide these services, it attempts to collect data on the entire hearing impaired population through college age in the United States. This population includes those who are receiving special educational services related to their hearing impairment, those who have been diagnosed as hearing impaired but who are not receiving such special educational services, and those who are in fact hearing impaired but whose hearing loss has not yet been diagnosed. The work of the Office has concentrated, to date, on the individuals in the first group, those who are receiving special educational services related to their hearing impairment.

The Annual Survey was begun in response to the concern of educators, audiologists, legislators, psychologists, and others working in the field of hearing impairment, indicating the need for national data of this type. The Survey began national operations in May, 1968, following two years of pilot and developmental work in a five state area to determine the operational feasibility of a program of this nature. The initial funding was supplied by the Bureau of Education for the Handicapped, U.S. Department of Health, Education, and Welfare. Continued financial support from 1972-1974 was provided by the National Institute of Education and by Gallaudet College. Present funding is provided by Gallaudet College, whose programs and services receive substantial support from the Department of Health, Education, and Welfare.

POLICIES

The Office actively encourages the use of its information and services and the original data on which they are based by administrators, researchers, teachers, and other professionals who are providing services to hearing impaired people, as well as by other individuals and groups devoted to improving the results of special education for hearing impaired persons.

In its work of developing and disseminating useful information, the Office has the benefit of the guidance and advice of its U.S.-Canadian Advisory Committee. Among its members are hearing and deaf individuals, administrators, researchers, educators, and specialists from other areas within the field of hearing impairment. Every attempt is made to maintain a wide diversity of interests and competencies, as well as geographic representation, among its members. On questions of a technical nature, consultants from specialized fields are utilized as particular needs arise.

While the Office is intended to be permanent and national in scope, it does not aim to replace or absorb the work of other programs at the state or local level which are devoted to the collection and dissemination of information on hearing impaired children and youth. Rather, it seeks to facilitate their work through cooperation whenever this is possible. Nor does the Office view itself as the center for all types of research in this field. It focuses its activities on collecting and disseminating national baseline data on selected topics of general concern to those interested in the education of hearing impaired children and youth. It seeks to make available to researchers, administrators, and other professionals the vast amount of information it possesses and any special services it can render to them.

One restriction which is observed by the Office is that no data will be released which permits the identification of an individual student or cooperating program. Exception to this occurs only when a written release is obtained from the program supplying the information. Otherwise, independent researchers using the data of the Annual Survey have access only to summary statistics or coded information.

Since the Office of Demographic Studies attempts to promote the use of its data by those whose judgments and decisions will have a direct or indirect bearing on the education of hearing impaired individuals, it recognizes a responsibility to devote a part of its resources to the evaluation and improvement of the quality of the information collected and disseminated. This is particularly important because it seeks to establish national norms on the basic characteristics of hearing impaired children and youth. Thus, in its dissemination of information, the Office makes every effort to properly qualify its data and indicate any limitations associated with it.

The Office of Demographic Studies seeks to avoid associating itself with an established position relating to controversial issues within the field of educating hearing impaired individuals. Thus, it does not draw policy conclusions from its data. Rather, it seeks to facilitate the use of its data by reputable individuals or organizations that may themselves wish to draw policy implications or test research hypotheses that are related to these issues.

DATA COLLECTION

During the first year of the Annual Survey, the 1968-69 school year, data collection activities were directed towards all schools for the deaf and a representa-

tive sample (15%) of all special classes. In addition, records on students who were receiving itinerant services were obtained in total from two states and in part from several states. In all, 25,363 individual records were collected during the 1968-69 school year.

Since then, the Survey has greatly increased its coverage of the population, both in regard to numbers and in its inclusion of hearing impaired students who are fully integrated into regular schools for hearing students and receive either no or only minimal, occasional services for their hearing impairment. During the 1976-77 school year, data on almost 54,000 students were collected by the Annual Survey, a number which included over 80% of the students in all types of special educational programs throughout the country.

PROGRAM SERVICES AND PUBLICATION OF THE DATA

The Office is accumulating a large volume of statistical data. The processing and dissemination of this information hold wide implications and potential benefits for educational, audiological, medical, psychological, legislative, and other services to the hearing impaired. Towards the goal of fully utilizing the data, the program makes it available to independent investigators for research purposes, including masters' theses, doctoral dissertations, institutional level research programs, private studies, etc. Competent researchers are encouraged to propose detailed analyses of the information to further increase its usefulness. In addition to the direct use of the accumulated data, a second significant value of this large volume of data is the potential it provides for selecting well-described samples on a national basis for special studies of relevant variables.

The Test Department of the Office has completed three National Academic Achievement Testing Programs, in 1969, 1971, and 1974. One result of the 1974 achievement testing program has been the production of national norms for hearing impaired students based on a special version of the 1973 edition of the Stanford Achievement Test revised for these students. The Test Department of the Office is able to supply the revised test materials and the national age-based norms to educational programs interested in using them to assess their hearing impaired students. Work is also underway on analysis of the vast amount of data generated by the achievement testing projects and by other collections of test information, such as the 22,000 nonverbal IQ test scores gathered in recent years.

The Office also provides each participating educational program with tabulations of the characteristics of its own students, as compared with national distributions and with other significant distributions such as those for the state or region in which the program is located. Programs wishing to obtain magnetic tape compilations of data for their programs for further analysis are provided with these materials. Standard Record Forms are available from the Office, as are the consulting services of the Office staff for programs wishing to develop or improve their data collection and record-keeping systems in the areas of student characteristics and educational performance.

The unique value of the project lies in its national perspective and in the nationwide network of contacts and working relationships which it has developed during the years of its existence and which underlies all its activities. It is the maintenance of this network and the accumulated experience in its use which allows the Office of Demographic Studies to provide the national baseline data needed by the field of education of hearing impaired children on a continuing basis.

The Office reports much of its data in its own publications series. A listing of the publications issued to date appears in Appendix 5 of this report. Reporting also takes the form of articles submitted for publication in professional journals (Appendix 5), reports made at professional meetings and conventions, and lectures or seminars at University training programs and other gatherings or associations to which staff members of the Office have been requested to make presentations.

FUTURE PLANS

During its years of operation since 1968, the Office has devoted most of its resources to gathering basic demographic information on hearing impaired students and to the development and standardization of achievement testing procedures for these students. Much attention has been paid to extending the breadth and quality of the data collection, analysis, and reporting.

As the description of the population of hearing impaired students has improved, it has become possible to begin a series of special studies on well-selected samples of these students. Sample studies are currently underway in which families of hearing impaired students and their classroom teachers are providing further information of relevance to the educational process.

Projects currently under consideration include studies of hearing impaired students in mainstream educational settings and of the vocational training and career education opportunities for hearing impaired students, possibly including some measures of student performance in these areas. Increasing national attention is also being given to the question of achievement or learning in the preschool programs for hearing impaired children; this may also be an area of future activity for the Office.

The success of the Office will ultimately be measured not only by the volume of data collected and reports published, but by the significance of the services it is able to render to those persons who work with hearing impaired children and youth.

APPENDIX 5

REPORTS AND ARTICLES FROM THE OFFICE OF DEMOGRAPHIC STUDIES

REPORTS FROM THE OFFICE OF DEMOGRAPHIC STUDIES

SERIES D

Gentile, A. & DiFrancesca, S. *Academic Achievement Test Performance of Hearing Impaired Students—United States: Spring 1969.* Series D, Number 1. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1973.

Gentile, A. & DiFrancesca, S. *Item Analysis of Academic Achievement Tests Hearing Impaired Students—United States: Spring 1969.* Series D, Number 2. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1970.

Rawlings, B. & Gentile, A. *Additional Handicapping Conditions, Age at Onset of Hearing Loss, and Other Characteristics of Hearing Impaired Students—United States: 1968-69.* Series D, Number 3. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1970.

Voneiff, P. & Gentile, A. *Type and Size of Educational Programs Attended By Hearing Impaired Students—United States: 1968-69.* Series D, Number 4. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1970.

Rawlings, B. *Summary of Selected Characteristics of Hearing Impaired Students—United States: 1969-70.* Series D, Number 5. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1970.

Voneiff, P. *Audiological Examinations of Hearing Impaired Students—United States: 1969-70.* Series D, Number 6. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1971.

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Gentile, A. & Rambin, J. B. *Reported Causes of Hearing Loss for Hearing Impaired Students—United States: 1970-71.* Series D, Number 12. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1973.

Buchanan, C., Ries, P., Sepielli, P., & Trybus, R. *Further Studies in Achievement Testing, Hearing Impaired Students—United States: Spring 1971.* Series D, Number 13. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1973.

Gentile, A. & McCarthy, B. *Additional Handicapping Conditions Among Hearing Impaired Students—United States: 1971-72.* Series D, Number 14. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1973.

Ries, P. Bateman, D., & Schildroth A. *Ethnic Background in Relation to Other Characteristics of Hearing Impaired Students in the United States.* Series D, Number 15. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1975.

SERIES C

Murphy, N. *National Survey of State Identification Audiometry Programs and Special Educational Services for Hearing Impaired Children and Youth—United States: 1972.* Series C, Number 1. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1972.

Trybus, R., Rawlings, B., & Johnson R. *Texas State Survey of Hearing Impaired Children and Youth: A New Approach to Statewide Planning, Monitoring, and Evaluation of Special Education Programming.* Series C, Number 2. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1978.

Rawlings, B. & Rubin, F. *A Survey of Media Equipment Available in Special Educational Programs for Hearing Impaired Students, 1977-78.* Series C, Number 3. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1978.

SERIES R

Jensema, C. & Trybus, R. *Reported Emotional/Behavioral Problems Among Hearing Impaired Children in Special Educational Programs: United States, 1972-73.* Series R, Number 1. Washington, D.C.: Gallaudet College, Office of Demographic Studies, 1975.

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